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ABSTRACT

This paper, one of a series from the Western Interstate Commission for Higher Education's project "Higher Education and the Economy of the West," describes 31 programs in 16 western states that illustrates higher education's contribution to the economy. Four school-university partnerships are described: the Pueblo School District 60/University of Southern Colorado Alliance, the California Academic Partnership program, the Puget Sound Educational Consortium, and the Bakersfield (California) College Tech Forestry program. State government-university initiatives include: the Center for the Advancement and Study of Tourism (South Dakota), the Morrison Institute for Public Policy (Arizona), the Utah Partnership for Educational and Economic Development, Total Quality Improvement in the North Dakota University system, and the Spokane Intercollegiate Research and Technology Institute. The small business outreach programs include: the South Dakota Business and Education Institute, the Center for Business and Economic Research (Nevada), the Idaho Small Business Development Center, the Small Business Development Center Network (Hawaii), Minnesota SURE Access, the Montana Entrepreneurship Center, and the Spokane Business Incubator. Technology transfer and workforce training programs listed include: the Engineering and Environmental Research Center (South Dakota), Optical Sciences Center (Arizona), Project S.U.C.C.E.S.S. (Hawaii), Labor Education and Research Center (Oregon), Public Utility Research and Training Institute (Wyoming), and Maricopa County (Arizona) Community Colleges. Outreach programs for rural and underserved populations are: the Alaska Native Health Center Program, the Regional Services Institute (Oregon), Area Health Education Centers (Arizona and New Mexico), the Central Oregon Consortium for Higher Education, and Electronic Distance Education (Utah). There are four regional initiatives: the WAMI (Washington, Alaska, Montana, and Idaho)

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medical education programs, Western Interstate Commission for Higher Education, NorthWestNet, and the Western Institute of Nursing. A list of all the programs recommended, by state, is appended. (Contains 20 references.) (CH)

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HIGHER EDUCATION
and the Economy of the West

Working Paper #3

The Higher Education-Economy Tie:

A Sampling of Exemplary Programs in the West

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Working Paper #3

The Higher Education-Economy Tie: A Sampling of Exemplary Programs in the West

Higher Education and the Economy of the West

Western Interstate Commission for Higher Education
P.O. Drawer P, Boulder, Colorado 80301-9752

Partial financial support was provided by The Ford Foundation

This is the third working paper for the WICHE project "Higher Education and the Economy of the West." It contains descriptions of more than 30 programs in 16 western states that exemplify the relationship between higher education and the economy. The project focus is an examination of the broad relationship between higher education and the economy and the ways in which higher education in the 16 WICHE states must change in order to be more responsive to the needs of the region in the 1990s and beyond.

The paper was prepared by the Office of Research and Policy Analysis of the Western Interstate Commission for Higher Education (WICHE). Comments on the paper should be addressed to Judith I. Gill, Director, Office of Research and Policy Analysis, WICHE, P.O. Drawer P, Boulder, CO 80301-9752, (303) 541-0224.

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Western Interstate Commission for Higher Education
P.O. Drawer P
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FOREWORD

This working paper is part of the Western Interstate Commission for Higher Education's (WICHE) project "Higher Education and the Economy of the West," partially supported by The Ford Foundation. It was designed, in part, to answer the question "How is higher education successfully strengthening the economy?" This paper describes more than 30 programs in the WICHE region that directly impact the economy, provides information on program achievements and future directions, and gives the names, addresses, and telephone numbers of contact people for each program.

Virginia L. Golder, research associate in the WICHE Office of Research and Policy Analysis, had primary responsibility for collecting and analyzing program information and drafting the paper. Diana Vari, research assistant, was responsible for reviewing and writing initial drafts of a number of program descriptions. Deborah Evans, free-lance editor, provided valuable editorial assistance. Denise Tregay, administrative secretary, assisted with program follow-up and prepared successive drafts of the paper. Cherie Pedersen, senior secretary, assisted with collecting program information.

WICHE gratefully acknowledges the State Higher Education Executive Officers (SHEEO) in the WICHE states for suggesting programs to be included in this publication. We also thank the many individuals at colleges and universities who supplied the necessary information for this paper.

Richard W. Jonsen
Executive Director

Judith I. Gill
Director
Research and Policy Analysis

Western Interstate Commission for Higher Education
Boulder, CO
August 1992

PREFACE

This working paper is one of six publications resulting from the WICHE project, "Higher Education and the Economy of the West." The two-year project began with the "simple" questions, "How does higher education contribute to the economy of the West?" and "How can the relationship be strengthened in light of future economic trends?" Over time it evolved into a project that considered a host of educational, demographic, economic and social issues, higher education's climate and broad range of responsiveness to economic needs, the unique character of the West (e.g., vast rural areas, reliance on public higher education), and a range of perspectives on higher education's role in the economy.

The project is not an economic analysis of higher education's impact on the economy. Rather it is an analysis of economic and educational trends and current higher education policies, and the ways in which these policies (or practices) should change so that higher education can meet the needs of a dynamic global economy.

Project Assumptions

Three primary assumptions have guided this project. The first is that the definition of higher education's contribution to the economy must be broadened. Often higher education's relationship with the economy is viewed within the narrow constraints of technology transfer and business-university alliances. In redefining the relationship, we return to the classic definition of the economy: the well-being of the majority of a society's citizens. When using this definition, the contributions that higher education makes to the economy include its connection with the public schools, the quality of undergraduate education, outreach programs for diverse racial and ethnic populations and rural areas, as well as research and development, technology transfer, centers of excellence, and specialized training.

The second assumption is that state policies can strengthen the relationship between higher education and the economy. Higher education must, therefore, work in coordination with state government to meet state economic needs.

The third assumption places the project in the context of fiscal constraints. Action taken by states and their colleges and universities is limited by the current austere financial climate. And because of fiscal limitations, cooperation and differentiation among institutions are more important than ever before.

Change is perhaps the most pervasive and unifying theme of the project papers. As the economy rapidly becomes global and interactive, our nation's colleges and universities must be prepared to meet the challenges of a transformed economy. Higher education will be required to continue to advance technology through research, to make greater use of limited resources through increased collaboration with public and private sectors, to be responsive to workforce needs, and to maintain educational quality and access for as broad a population as possible. If higher education can be characterized as having responded to the economy by taking small steps in primarily one direction, WICHE is advocating giant steps in some new directions. In the words of Clark Kerr, "The major

test of a modern American university is how wisely and how quickly it adjusts to important new possibilities" (Kerr, 1977).

WICHE's Perspective

Given its history of fostering regional cooperation, WICHE's inclination on this project was to look for ways in which higher education could work in concert with the public schools, business and industry, local and state government, and the community to meet emerging economic needs.

The WICHE Commissioners, representing 16 western states, determined the project agenda, particularly its policy focus. While the Commissioners adopted a regional policy perspective for this project, they also understood that blanket recommendations are not possible or practical. Rather, general direction and insights on regional changes should play a role in determining a state's higher education agenda.

Project Components

In order to set boundaries on a project of this size and scope, we began with a list of 10 critical issues that have an impact on higher education's role in the economy:

1. Quality Undergraduate Education
2. Higher Education and Public School Connections
3. Educational Progression of Racial and Ethnic Minorities
4. State Higher Education Funding Priorities
5. Alternative Educational Delivery Systems
6. International Education
7. Differentiation of Institutional Roles and Missions
8. Identification and Development of Academic Programs to Meet Workforce Needs
9. Higher Education Research
10. Strengthening the Relationship Among Higher Education, Government, and the Private Sector

The critical issues and the project activities—a collection of economic and educational data, survey of recent literature, sampling of exemplary programs, interviews with participants and observers of education, economic, and governmental systems, and a review of state economic development and higher education master plans—defined the project scope. As the various project activities were undertaken and after several conversations with higher education policymakers, the critical issues remained virtually the same but their focus changed to reflect what was learned. Individual project undertakings by themselves did not reveal fully the higher education-economy relationship; however, like pieces of a mosaic, when viewed as a whole, they became a powerful picture and allowed significant insight.

The following is a list of the working papers and the final report resulting from WICHE's "Higher Education and the Economy of the West" project. The working papers serve as a foundation for the final report—much of the policy analysis and observations in the final report are based on information from the five working papers.

- *A Region of Contrasts: An Educational and Economic Profile of the West (Working Paper #1)* is a presentation and analysis of demographic, workforce, and educational data for 16 western states. Data including employment by sector, educational attainment, foreign exports, and the location of higher education institutions in relation to population centers are examined at a regional level in Section One of the report. In Section Two, selected economic and educational characteristics are reported for each western state.

- *Exploring the Relationship: A Survey of the Literature on Higher Education and the Economy (Working Paper #2)* is a survey of recent literature on the relationship between higher education and the economy and a commentary on how this relationship can be enhanced. The paper addresses issues including the education challenges posed by a global economy, the essential education skills that workers will need, the role of technology in education and the economy, and infusing internationalism and multiculturalism into the educational experience. Publications by economists, education scholars, policy experts, government panels, and higher education and economic agencies are reviewed.

- *The Higher Education-Economy Tie: A Sampling of Exemplary Programs in the West (Working Paper #3)* is a review and analysis of more than 30 programs in the West that illustrate higher education's contribution to the economy. Programs fall into five categories: (1) school-university partnerships; (2) government-university initiatives; (3) small business outreach; (4) technology transfer and workforce training; and (5) rural or underserved population outreach.

- *Insights on the Higher Education-Economy Relationship: Interviews with the Stakeholders (Working Paper #4)* is a summary of interviews with a small group of knowledgeable and experienced participants and observers of education, economic, and governmental systems. The interviews sought their insight on what issues must be addressed if higher education is to be responsive to economic needs in the 1990s and the 21st century. The paper summarizes interview conversations and is organized around four general themes: planning for the future; responding to the public and serving a new student clientele; effective collaboration; and the relationship of curriculum reform to faculty productivity and rewards.

- *Joined or Unconnected? A Look at State Economic Development and Higher Education Plans (Working Paper #5)* is a summary and analysis of the most recent state higher education master plans and economic development plans in the 16 WICHE states. The plans were reviewed with an eye toward noting how they relate to each other—that is, in what ways the statewide higher education plans articulate and address concerns with economic planning and development, and in

what ways the economic plans articulate and address concerns with higher education planning and development.

- *Meeting Economic and Social Challenges: A Strategic Agenda for Higher Education (Policy Recommendations)* is the final report of the project. It presents project conclusions and a series of recommendations to state legislators and higher education policymakers. Included in the policy options discussion are implementation issues and examples of states and institutions currently making the recommended policy changes.

I. INTRODUCTION

Whether they are called partnerships, alliances, collaborations, public service, or community outreach, the ways in which colleges and universities contribute to the economy and society are varied and far-reaching. They range from school/university partnerships and educational programs for underrepresented racial and ethnic groups, to small business centers and centers of excellence. All are programs that educate our future workforce, transfer technology, and/or encourage economic development.

This working paper identifies programs in 16 western states that exemplify the relationship between higher education and the economy[1]. The programs address real needs of communities they serve and commonly take an interdisciplinary approach (i.e., involve a range of institutional departments) to problem-solving or providing services. Faculty, and often students, are key to program operations. Most programs receive some funding from state government. Some of the programs have obvious ties to economic development, such as the Center for the Advancement and Study of Tourism in South Dakota, which trains students for leadership positions in tourism. Others, such as the California Academic Partnership Program, which supports curriculum reform and assessment projects, affect the economy by improving the education of future workers.

At the end of this paper, regional programs are highlighted.

This paper was developed, in part, to answer the question, "How is higher education successfully strengthening the economy?" The goal of this working paper is to provide higher education policymakers with examples of successful models, and to give them an idea of program policy environments and the challenges facing such programs.

Scope

Virtually all institutions have exemplary programs in place. It is important to recognize that this paper covers only a sampling of program **types** in the West. They represent a cross-section, not an exhaustive list of successful programs in the region.

The programs selected for this publication are a subset of approximately 60 programs recommended by the State Higher Education Executive Officer (SHEEO) in each of the WICHE states[2] (a list of all of the recommended programs is provided in the Appendix). Full descriptions are presented for programs that have demonstrated success and have received recognition in their home states and sometimes nationally.

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[1]The programs reported here are limited to public higher education, WICHE's primary audience.

[2] The Western Interstate Commission for Higher Education (WICHE) 16-state region is Alaska, Arizona, California, Colorado, Hawaii, Idaho, Minnesota, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming.

Exemplary Program Categories

Each program falls into at least one of five categories: (1) school-university partnerships; (2) government-university initiatives; (3) small business outreach; (4) technology transfer and workforce training; and (5) rural or underserved population outreach. Most of the diverse programs reviewed in this paper fall into more than one of the categories.

School-University Partnerships. Over the past decade, many colleges and universities have entered into partnerships with elementary and secondary schools with the goals of improving curricula, increasing understanding and cooperation between the two education sectors, enhancing faculty development, and examining education public policy issues. Typically, a university's College of Education partners with the public schools; however, included in this paper are two examples of partnerships involving departments and faculty from throughout the university.

The economic importance of connections between higher education and K-12 cannot be overstated. Numerous reports emphasize that basic skills such as reading, writing, speaking, computation, as well as higher order critical thinking skills, are crucial to the nation's economic vitality (Bailey, 1990; Business-Higher Education Forum, 1983; Reich, 1991; Thurow, 1991). Improving the skills of America's workforce will require the two sectors to work together to create appropriate curricula for all grade levels (K-16) and cultivate interactive teaching styles that promote independent and creative thinking. In addition to serving the economy, there are self-interested motives for collaboration: colleges and universities rely on public schools to prepare students adequately and for successful examples of teaching and learning; in turn, public school benefits include an improved academic program and teacher development, and new approaches to measuring teaching and learning.

State Government-University Initiatives. Because a large portion of public college and university revenue comes from the state, it is possible to define *all* programs as "government-university initiatives." However, there are examples of specific agreements between state governments and higher education institutions concerning the establishment of a center, program, or task force to advance high technology and public policy research and application. Such initiatives sometimes involve a Governor's Economic Development Office and usually are cross-disciplinary efforts.

Small Business Outreach. This category encompasses small business development centers, business incubators, and other programs that conduct small business outreach. Every state in the WICHE region has small business development centers (SBDC) that provide services including start-up and management counseling, marketing research and planning, and short courses. SBDCs often are located on college campuses and make use of faculty and student resources. They can be important training grounds for business students. The centers are especially important to the rural regions in the West, where over 90 percent of businesses are small enterprises.

Technology Transfer and Workforce Training. Programs in this category are responsible for high technology research and development, as well as contract training between community colleges and businesses. While centers promoting small businesses and entrepreneurship are located at both non-urban and urban institutions, these centers and programs usually are located at large urban institutions.

Rural and Underserved Population Outreach. These are programs that broaden higher education access for people in rural areas or for those from diverse racial and ethnic groups. They include educational programs that target specific minority or rural populations, and others designed to increase the professional workforce in rural regions.

Both racially and ethnically diverse and rural populations pose challenges to higher education. As a whole, racially and ethnically diverse populations are underrepresented in higher education. It is this same group that is projected to have the largest population growth in the 1990s. In an economy that increasingly demands high skills, racially and ethnically diverse groups require increased access to some form of postsecondary education. Moreover, rural areas have experienced economic losses in agriculture and natural resource industries over the past two decades; as a result, there is a great need for programs to retrain workers and assist new businesses. Colleges and universities can help meet those needs by providing avenues for greater educational access.

For additional information on programs for underrepresented ethnic and racial populations, see the WICHE publication, *A Crucial Agenda: Making Colleges and Universities Work Better for Minority Students* (1989).

Exemplary Programs

The programs reported here, in brief, are:

School-University Partnerships

1. The **Pueblo School District 60/University of Southern Colorado Alliance** is a formal, cooperative agreement designed to improve curriculum quality and student academic performance, enhance faculty development, and find cost-saving approaches to administration at the public schools and the university. The partnership is unique: it involves administrators and faculty from the entire university (not just from the college of education), the university president and school superintendent are fully active in the alliance, and there is faculty exchange from both education sectors.

2. The **California Academic Partnership Program (CAPP)**, administered by the California State University, supports curriculum improvement and assessment projects. Its primary goal is to better prepare students, particularly students from racial and ethnic groups that are underrepresented at the postsecondary level, for higher education.

3. The **Puget Sound Educational Consortium (PSEC)**, a partnership between the University of Washington's College of Education and 13 school districts, promotes teacher

and administrator leadership skills, introduces new teaching approaches, creates networks among schools, and encourages collaboration.

4. The **Bakersfield College Tech Prep/Associate Degree Forestry Program** is a tech prep/associate degree (or "two-plus-two") program. Students spend two years in a special high school program which prepares them for two years of forestry training at Bakersfield College (CA). The partnership allows the College, the Bureau of Land Management, the U.S. Forest Service, Kern County high schools, and a number of public four-year institutions in California a voice in the career training of forestry workers. The program's success is due primarily to the fact that students work during the summers for the U.S. Forest Service or the Bureau of Land Management, and are guaranteed full-time employment with one of these two organizations when they complete the program.

State Government-University Initiatives

5. The **Center for the Advancement and Study of Tourism (CAST)** is part of the South Dakota Governor's economic development plan to stimulate tourism as a local and national industry. Located at Black Hills State University, the center serves as a clearinghouse of information on the tourism industry and provides research assistance to communities statewide.

6. The **Morrison Institute for Public Policy**, located at Arizona State University, conducts policy research and analysis, evaluates programs, engages in strategic planning, holds public policy forums, and acts as a liaison among state and local government, business, and the university. Among a number of strategic planning efforts, the Institute has been involved with the Arizona Strategic Planning for Economic Development (ASPED) project.

7. The **Utah Partnership for Educational and Economic Development** was established in 1990 by the Utah Task Force on Education and Economic Development to examine how education can increase its contribution to the health of the state's economy. The partnership is charged with examining ways to (1) match training and education with market needs; (2) identify and match the needs and resources of education and business; (3) communicate Utah's economic, educational, and cultural assets to the public; (4) improve basic education at all levels; and (5) enhance research and development.

8. **Total Quality Improvement (TQI) in the North Dakota University System** is a management approach that emphasizes increasing quality, productivity, and teamwork while decreasing cost. Higher education's adoption of TQI has led to new partnerships among higher education, business, and state and local government.

9. The **Spokane Intercollegiate Research and Technology Institute (SIRTI)**, established by the Washington legislature in 1989, is a regional resource center promoting partnerships between industry and five eastern Washington higher education institutions. It was designed to coordinate research and development efforts, match industry needs with the knowledge and expertise of faculty, scientists, and technicians, use computer

networking and telecommunications systems to link businesses, researchers, and developers, and offer academic programs.

Small Business Outreach

10. The South Dakota **Business and Education Institute (BEI)** assists businesses and promotes economic development through programs such as the Center for Innovation, Technology, and Enterprise (CITE), which was started in the Governor's Office of Economic Development, and links faculty with private industry to facilitate technology transfer.

11. The **Center for Business and Economic Research (CBER)** at the University of Nevada, Las Vegas, collects, analyzes, and disseminates economic and business information to businesses and the University, and provides technical expertise and research services that support economic diversification.

12. The **Idaho Small Business Development Center (SBDC)**, based at Boise State University, provides consulting, training, and applied research to small businesses statewide as well as grant writing support to small businesses applying for Small Business Innovation Research (SBIR) funding.

13. The **Small Business Development Center Network (SBDCN)** at the University of Hawaii, Hilo, provides management assistance to small businesses statewide, through workshops, training, and resource centers.

14. **Minnesota SURE Access**, based at St. Cloud State University, is an electronic catalog that makes the resources of the Minnesota State University System available to individuals, organizations, communities, government agencies, and businesses. Resources in the catalog represent a broad range of expertise from arts and humanities to marketing and engineering.

15. The **Montana Entrepreneurship Center**, based at the University of Montana, links entrepreneurs and businesses with research, facility, and equipment resources of the six-campus public university system, and with public and private sector resources as well.

16. The **Spokane Business Incubator**, established by Eastern Washington University, has two business clusters: an office cluster with space for up to 22 businesses, and the Kitchen Center, a licensed food-production facility for small businesses.

Technology Transfer and Workforce Training

17. The **Engineering and Environmental Research Center (EERC)** located at South Dakota State University supplies technical and scientific support to industry. It is composed of five programs: (1) Engineering Experiment Station; (2) Office of Remote Sensing; (3) South Dakota Space Grant Consortium; (4) Transportation Technology Transfer Service; and (5) University/Industry Transfer Service.

18. The **Optical Sciences Center** at the University of Arizona conducts theoretical and applied research in optics. Founded with a U.S. Air Force grant in 1967, it has strong links with area and national industries.

19. **Project S.U.C.C.E.S.S. (Sheraton's Unified Commitment Concerning Employee's Self-Success)** is a workplace literacy partnership between the ITT Sheraton Hotels of Hawaii and the University of Hawaii, Manoa. The program offers education in English as a second language, literacy skills, and basic reading, writing, and mathematics skills to ITT Sheraton employees.

20. **Labor Education and Research Center (LERC)** faculty at the University of Oregon provide research, teaching, and public service, ranging from leadership programs to courses on grievance handling, collective bargaining, and arbitration.

21. University of Wyoming's **Public Utility Research and Training Institute (PURTI)** provides training opportunities and research information to a wide range of state public utility providers and regulators. PURTI produces PURTI Research Summaries, a publication designed to offer regulatory commissions and other public utility organizations easy access to academic studies and other information published in academic or technical journals.

22. Arizona's 11 **Maricopa County Community Colleges/Centers** are recognized nationally for their strong academic programs, high student transfer rate to four-year degree programs, and innovative alliances with industry. Maricopa is the second-largest community college system in the nation and the largest higher education provider in Arizona.

Rural and Underserved Population Outreach

23. The **Alaska Native Health Career Program (ANHCP)** at the University of Alaska, Anchorage recruits, trains, and retains Alaska Natives in the health care professions. It also serves as the umbrella organization for programs such as the Della Keats Summer Enrichment Program, a six-week program in college preparatory math, science, and English for Alaskan Native high school juniors who are interested in health fields.

24. The **Regional Services Institute** at Eastern Oregon State College assists rural counties with research and grant writing, small business development, education and training, and rural marketing.

25. **Area Health Education Centers (AHEC)** were developed by the federal government to increase the number of health practitioners in rural areas throughout the nation. Nine of the 32 AHEC headquarters are located at colleges in the WICHE region. AHECs in Arizona and New Mexico are described in this paper.

26. The **Central Oregon Consortium for Higher Education (COCHE)**, which grew out of a need for four-year higher education degree programs in central Oregon, provides access to five baccalaureate and two masters degree programs. Faculty from colleges and universities travel to Central Oregon Community College to teach and advise students.

27. **Electronic Distance Education in Utah** includes EDNET, an education network which delivers K-12 and college courses to 21 classroom sites across the nation; KULC-TV, a statewide education television station which delivers nine telecourses; and Utah State University's COM-NET Electronic Distance Education system, which provides degree programs at 16 sites, including the state prison.

Regional Programs

28. The **WAMI Program** is a medical education agreement between the University of Washington School of Medicine and universities in Washington, Alaska, Montana, and Idaho. It provides access to medical education and expands the distribution of physicians in rural areas of the WAMI region.

29. The **Western Interstate Commission for Higher Education (WICHE)** was established in 1953 by the Western Regional Education Compact, an interstate agreement among western states. Its mission is to "facilitate resource sharing, collaboration, and cooperative planning among the western states and their college and universities." WICHE has a number of cooperative programs, conducts research and policy analysis on public higher education issues, and provides legislative policy workshops. Cooperative programs include student exchange, education telecommunications, mental health, workforce development, and institutes on ethnic diversity.

30. **NorthWestNet** is a high speed supercomputing network serving higher education institutions, government laboratories, and private businesses in six western states. The network is used for national and international electronic mail by universities and businesses, transferring data files and software, and for other kinds of research and collaboration.

31. **The Western Institute of Nursing (WIN)** monitors relevant nursing issues and trends, and designs, implements, and evaluates regional, action-oriented strategies in nursing education, practice, and research. WIN succeeded the Western Council on Higher Education for Nursing (WCHEN), an integral part of WICHE from 1957 to 1985.

Organization of Working Paper

Sections II through VI include exemplary programs based at public colleges and universities in the WICHE region that primarily serve state economic needs. Section VII examines regional efforts to expand higher education access, increase the participation of diverse racial and ethnic populations in higher education, and serve area health care needs.

II. SCHOOL-UNIVERSITY PARTNERSHIPS

Since the publishing of A Nation at Risk, a report that describes our nation's schools as "eroded," "mediocre," and "compromised," reforming public schools and improving teacher education have become critical concerns (National Commission on Excellence in Education, 1983). Some in higher education have responded by establishing formal ties with public schools and conducting research on teaching and learning in these schools. From a review of the programs described here and other anecdotal evidence, we conclude that these partnerships have been most successful when at least one of the following is true: (1) the partnership is a formal agreement; (2) colleges and universities recognize and reward applied research on public schools; (3) top educational leaders are committed to the partnership; (4) school districts and universities are willing to commit resources to the effort; (5) schools and universities alike have an impact on structural and curricular changes in both sectors; and (6) a combination of parents, community leaders, university faculty and administrators, school teachers, students, and government leaders support the partnership. The programs described here exhibit one or more of the essential conditions for success.

Program articulation agreements are one form of partnership between higher education and the public schools. A growing number of high schools and technical, junior, or community colleges have "two-plus-two tech-prep/associate degree programs," consisting of two years of high school and two years of college training in specific technical and advanced skill areas. Two-plus-two programs have been successful in better preparing students for work in advanced technical fields, in better coordinating high school and college curricula, and in enabling students to make "smoother transitions" from high school to college technical programs (AACJC, 1987). According to Dale Parnell, "the tech-prep/associate degree program advocates taking a step beyond the current and usually cosmetic high-school/college partnership arrangements into substantive program coordination" (Parnell, 1985, p. 140).

In an era when competition for funds and public criticism of educational quality have sometimes pitted the two sectors against one another, school-university partnerships help break down barriers and move toward an "all one system" approach to education.

1. **Pueblo School District 60/University of Southern Colorado Alliance** (Colorado)

In 1991, District 60 public schools in Pueblo, Colorado and the University of Southern Colorado (USC) entered into a formal, cooperative agreement with the goals of improving curriculum quality and student academic performance at all levels, enhancing faculty development, and finding cost-saving approaches to administration. While still in its beginning stages, the alliance has the potential to become a national model because of its distinctive partnership approach. It is funded jointly by the university and the school district with help from private grants.

One unique aspect of the alliance is the fact that the entire university—not just the college of education—is involved in the effort. The comprehensive alliance involves USC

administrators, faculty, and students from a wide range of arts and science disciplines, as well as teachers, administrators, and students from the school district. The USC president and the superintendent of schools are fully active in the alliance. A second aspect that sets the alliance apart from other partnerships is that the superintendent of District 60 schools also holds the post of USC vice president and reports to both the university president and the board of education. In addition the executive director of facilities and management has joint responsibility for the USC physical plant and maintenance and operation at the district.

Fourteen programs which provide direct linkages between the university and the public schools are in various stages of development. They range from a student mentoring project to expanding the use of telecommunications throughout southern Colorado. Examples of a few of these linkages are:

(1) High School Senior-to-College Sophomore Program. This program allows high school students to take honors or advanced-placement classes and receive dual credit at the University of Southern Colorado. Students are required to pay a nominal fee for these studies.

(2) Curriculum Articulation in the Sciences. The newly established Center for the Advancement of Science, Math, and Technology at USC will make curriculum resources available to K-12 and university faculty, sponsor workshops, and engage guest speakers, with the goal of improving science instruction at all levels.

(3) USC Student Mentor Project. This project matches USC students with "at-risk" youth, according to interests, backgrounds, and other factors, to serve as mentors and role models to students at all grade levels.

(4) Teacher Development Center. The Alliance has established a Center for the Advancement of Teaching and Learning, concerned with a fundamental restructuring of the university's teacher training programs.

(5) Faculty Exchange Program. Faculty from School District 60 will teach courses at USC, and USC professors will teach courses at district schools. The goal is to allow faculty to learn from new teaching experiences and to improve curriculum at all levels.

The alliance has a 14-member National Advisory Board composed of national education leaders, scholars, and practitioners. This board assists with the success of the alliance and promotes it as a model for cooperative relationships between public schools and higher education.

Achievements and/or Future Directions. As with any effort of this size and scope, the alliance has had some difficulty clarifying institutional and individual roles. Some faculty are skeptical about the alliance and have been hesitant about some of the measures under

way. There is a general consensus that time is needed in order to judge the extent of the alliance's success.

The alliance seeks to continue streamlining administrative costs and passing the savings on to instruction, and to develop additional linkage programs. In the future there is potential for expanded cooperation between the alliance and Pueblo's two other major education institutions: District 70 and Pueblo Community College.

Contact Person. Dr. Henry Roman, Associate Superintendent for Transition Activities, School District No. 60, 315 West 11th, Pueblo, CO 81003, (719) 549-7150.

2. **California Academic Partnership Program** (California)

The California Academic Partnership Program (CAPP) connects public school faculty and administrators with their counterparts at colleges and universities, "to improve student learning in college preparatory courses." The primary objective of the program is to better prepare students, particularly students underrepresented at the postsecondary level, for higher education. CAPP, established in 1984 by the California legislature, is funded annually by the state and other grant monies and is administered by the California State University. Over $7 million has supported 40 academic partnerships since the program's inception. Nearly all segments of education in California—public schools and public and private two- and four-year colleges and universities—are affiliated with the program.

CAPP is guided by a 12-member advisory committee appointed by the CEOs of public schools, colleges, and universities, the State Student Aid Commission, and the California Postsecondary Education Commission. The committee identifies problems and needs, sets grant award criteria, monitors projects, assists projects in achieving partnership development, and recommends whether projects should be continued.

CAPP funds two types of partnerships: (1) curriculum-improvement projects; and (2) assessment projects to assist elementary and secondary school teachers in evaluating curriculum and student achievement. The depth and breadth of CAPP's programs is enormous. The Mathematics Diagnostic Testing Project, and the Academic Partnership: Teaching for Transition from High School to College, described below, are just two of CAPP's programs.

The goal of the Mathematics Diagnostic Testing Project (MDTP), funded since 1984, is to encourage students to persist in their mathematics studies and to improve college preparatory mathematics curricula and instruction. MDTP offers a series of diagnostic tests to measure math readiness of over 300,000 students each year, scores the tests, and provides detailed information about performance to each student and teacher. Test results help stimulate dialogue between secondary and postsecondary mathematics faculty about curriculum, and encourage curriculum reform. The program has 10 sites located on California State University and University of California campuses.

CAPP supports approximately 37 curriculum-improvement projects. One of these is the Academic Partnership: Teaching for Transition from High School to College, started in 1987 and located in rural Dos Palos. The partnership seeks to improve the achievement, college recruitment, and success of students through curriculum revision in language arts and social sciences. A team of postsecondary and secondary faculty members from California State University, a community college, and the high school and elementary school districts analyze college language arts requirements and the content and methods of language arts courses in grades 7 through 12. The faculty have created "Literature Link," fully articulated language arts and social science curricula for grades 7 through 12. Portions of the curricula are team-taught via the Televised Learning Network.

All Dos Palos high school language arts and social studies classes have participated in the project, which has served almost 1,000 students, of whom one-half are Latino and 7 percent African-American. As a result of the project, more students have enrolled in college preparatory courses, taken the Scholastic Aptitude Test, and enrolled in postsecondary institutions. The percentage of minority students enrolled in college preparatory English now equals that of the total school population.

Achievements and/or Future Directions. An evaluation of CAPP programs was conducted for the 1987-90 cycle. The evaluation report concluded that in that period, CAPP helped almost a million students, more that 50 percent of whom were African-American, Latino, or American Indian, or from rural and/or low income families. A higher percentage of these students enrolled in college preparatory classes, completed college preparatory sequences, and graduated from high school. The Dos Palos CAPP project has been designated a demonstration project, and its members assist new CAPP project leaders.

Contact Persons. Dr. Frank W. Young, Director, California Academic Partnership Program, 400 Golden Shore, Suite 132, Long Beach, CA 90802-4275, (310) 985-2500. The Mathematics Diagnostic Testing Project: Alfred Manaster, University of California, San Diego, Department of Mathematics, C-012, La Jolla, CA 92093-0112, (619) 534-2644. The Academic Partnership: Teaching for Transition from High School to College: L. Faye Johnson, Director of State and Federal Projects, Dos Palos Joint Union High School District, 1658 Center Street, Dos Palos, CA 93620, (209) 392-2131.

3. **Puget Sound Educational Consortium** (Washington)

The Puget Sound Educational Consortium (PSEC) is an example of a large-scale partnership between the University of Washington's College of Education and 13 school districts in the Puget Sound area. It is exemplary in that it illustrates how connections can be made among a large number of institutions and how program-initiated projects can become full-fledged programs on their own.

Established in 1984, the Consortium's ongoing projects promote teacher and administrator leadership skills, introduce new teaching approaches, create networks among schools, and

encourage collaborations. The overall goal of the consortium is to launch comprehensive programs that will address problems in the schools as well as improve colleges of education. Consortium member districts and the College of Education each pay approximately $26,000 per year in membership dues and the Consortium receives additional funding from foundations and corporations. The program is administered by an Executive Director, who is a full professor at the College of Education. Policy is set by the Coordinating Council which is made up of the superintendent of each member district and the Dean of the College of Education.

The following are current Consortium projects:

(1) Creating Schools for All Children (CSAC). CSAC is a network of seven schools that explores ways to improve the academic success of children from lower income and ethnically or racially diverse backgrounds. In addition, participants from each school are paired with those of another network school to exchange site visits and share reform ideas.

(2) Accelerated Schools Program. The Consortium houses a Satellite Center of the Accelerated Schools Program that is based at Stanford University. Schools in this program aim to bring at-risk students into the "educational mainstream by the end of elementary school and to support their accelerated progress in middle schools" (Accelerated Schools Newsletter, winter 1991). Students, parents, teachers, administrators, and staff all share responsibility in setting and achieving goals. The Satellite Center coordinates the efforts of three elementary schools and one middle school.

(3) Soundfire. The Consortium sponsors Soundfire, a teacher outreach network that is part of the national Foxfire Project. Soundfire teachers learn experiential, collaborative, and interdisciplinary teaching approaches.

(4) Professional Development Centers (PDC). These Centers involve elementary and secondary schools and the College of Education in the joint process of preparing pre-service teachers and implementing school reform. The PDCs engage the school site and university faculties in the preparation program. Student teachers become school faculty members and public school teachers serve as their mentors. Currently there are four PDCs.

(5) Action Research. With Action Research, teachers and administrators take responsibility for self-improvement. They design teaching and learning research questions and evaluate their own progress.

(6) CIGnet. CIGnet is an electronic mailing and conferencing system that allows for communication among those connected with Consortium projects.

(7) Policy Initiatives. The Consortium occasionally publishes papers that examine critical policies facing schools in the State of Washington.

In addition to ongoing projects, the Consortium sponsors seminars and workshops on school reform.

Achievements and/or Future Directions. In 1992-93 the Consortium will increase the number of Professional Development Schools to eight, with a goal, ultimately, to develop 20 Professional Development Schools to prepare all pre-service teachers. Other planned activities include: developing a leadership institute that will focus on preparing teachers and administrators to provide leadership at the school site level, and expanding the capacity of member districts and schools to implement comprehensive change.

Contact Person. Dr. Richard C. Williams, University of Washington, PSEC, Miller Hall, Room 300, Mail Stop DO-12, Seattle, WA 98195, (206) 543-7267.

4. **Bakersfield College Tech Prep/Associate Degree Forestry Program** (California)

The cooperative education forestry program is one of Bakersfield College's often-cited tech prep/associate degree agriculture (or "two-plus-two") programs[3]. The partnership allows the College, the Bureau of Land Management, the U.S. Forest Service, Kern County high schools, and a number of public four-year institutions in California to influence the career training of future forestry workers. The forestry program's success is due primarily to the fact that students work during the summers for the U.S. Forest Service or the Bureau of Land Management, and are guaranteed full-time employment with one of these two organizations when they complete the program.

The cooperative education program was open to eight students in 1991 and to five more in 1992. Students take a broad range of academic and applied courses, from biology and geology to courses in wildlife and recreation. As in other tech prep/associate degree programs, the high schools and colleges coordinate curriculum and instruction so that students make a smooth transition through the four-year program. In addition to being guaranteed summer and post-graduation employment, students wishing to complete a bachelor's degree can receive transfer credit at one of four public California universities—for them, the forestry program is actually a "two-plus-two-plus-two" program[4]. Students who go on to complete their bachelor's degree receive the same employment guarantee.

[3] The Kern community college district and the Kern high school district established two-plus-two tech/prep agriculture programs in the early 1980s. The two-plus-two programs have been cited in a number of community college and economic development publications.

[4] The four universities are California State University, Chico; California Polytechnic State University, San Luis Obispo; Humboldt State University; and University of California, Berkeley.

Achievements and/or Future Directions. Currently the program is associated with two national forests and the local Bureau of Land Management. Administrators of the program are seeking to expand the number of national forests and Bureau of Land Management districts connected with the program.

Contact Person. Bill Kelly, Agriculture, Professor/Counselor, Bakersfield College, 1801 Panorama Drive, Bakersfield, CA 93305, (805) 395-4527.

II. STATE GOVERNMENT-UNIVERSITY INITIATIVES

State governments and universities can work collaboratively in meeting state, regional, and even national needs. There are numerous programs and centers established by states and higher education institutions to advance technology research, provide training for government leaders, analyze public policy, and improve social services. These programs address a variety of issues, from how to improve local air quality to what economic development strategies the state should adopt.

The programs described here take comprehensive approaches to addressing state needs or problems; faculty from across disciplines are involved and each program has many "sub-programs" that confront different state issues. In addition, rather than limiting their focus to business assistance, the programs concentrate on a broad range of economic issues.

State government-university initiatives are an excellent method of demonstrating institutional accountability to the public. They are important because often the relationship between public higher education and the state is characterized by a tenuous balance between institutional autonomy and accountability.

5. **The Center for the Advancement and Study of Tourism** (South Dakota)

The Center for the Advancement and Study of Tourism (CAST) was established in 1988 as part of the Governor's economic development plan to stimulate tourism as a local and national industry. CAST was awarded a grant from the South Dakota Office of Economic Development to support the three primary Center activities: educational training, community outreach, and research. It is located at Black Hills State University and is funded by the state and by other grant monies.

CAST is part of the University's College of Business and Public Affairs, which offers undergraduate and graduate degrees in tourism. The curriculum focuses on preparing students for leadership and managerial positions and is "decidedly cross-disciplinary and applied in nature." Internships at resorts, Chambers of Commerce, and the South Dakota Department of tourism are available to the program's senior undergraduates. In addition to degree programs, the College offers workshops and seminars for individuals seeking additional non-degree studies. Tourism faculty represent a wide range of disciplines including marketing, social science, and journalism.

CAST conducts both applied and academic research. Applied research includes recreation needs assessments, attitude surveys, and other forms of assistance for cities considering expansion of recreation and tourism services. Graduate students, in collaboration with program faculty, conduct the academic research.

CAST serves as a clearinghouse for information on the tourism industry. Its database provides communities with access to a variety of tourism-related data. Other outreach efforts include a Tourism and Natural Resources Consortium which brings together

students, faculty, and professionals for resource sharing, professional development, and hands-on training.

Achievements and/or Future Directions. CAST plans to continue fostering growth of statewide and regional tourism by providing seminars, workshops, research, and consultation to commercial, education, and governmental organizations. CAST is currently the marketing research firm for the city of Deadwood's gaming industry.

Contact Person. Dr. Jeffrey B. Zeiger, Director, The Center for the Advancement and Study of Tourism (CAST), Black Hills State University, University Station Box 9674, Spearfish, SD 57799-9674, (605) 642-6341.

6. **Morrison Institute for Public Policy** (Arizona)

Located at Arizona State University (ASU), the Morrison Institute for Public Policy conducts policy research and analysis, evaluates programs, engages in strategic planning, holds public policy forums, and acts as a liaison among state and local government, business, and the university. It was established in 1981 to analyze policy issues for public and private sector clients and is funded through grants and contracts from state and local government agencies, and a wide range of other public and private organizations. Institute faculty and policy analysts come from a broad range of disciplines including education, environmental studies, urban studies, and social science.

Over the decade since it was established, Morrison Institute has completed a wide range of studies. Among them are:

(1) *Urban Growth in Arizona*, a study commissioned by the Arizona legislature to analyze "the impact of urban growth on Arizona's quality of life, water supply, social services, fiscal policies, and leadership."

(2) *Regional Airport Feasibility Assessment Study*, commissioned by the Arizona Department of Transportation to determine the feasibility of a new regional airport.

(3) *Kids Count*, funded by a private foundation with the goal of compiling data and information on "more than 35 indicators of children's health, well-being, and achievements," in order to inform policy decision making.

(4) *Arizona High Technology School*, a project to analyze the potential need for a high school whose curriculum would focus on science, mathematics, and technology. Commissioned by private industry and the state's department of education, the project resulted in legislation to establish the school.

(5) *Arizona's Taxing Choices*, a study analyzing state expenditures, revenues, and public opinion on government services.

In addition to these projects, the institute has evaluated existing programs such as the Arizona At-Risk Pilot Project, a program for at-risk children, and a minority student recruitment and retention project at ASU.

Among a number of strategic planning efforts, the institute has been involved with the Arizona Strategic Planning for Economic Development (ASPED) project. The first phase of the project was a strategic assessment of the state's economy and competitive status and resulted in the report, *Arizona at the Crossroads*[5]. The second phase included town hall meetings and other public forums to seek public input on economic development issues.

The institute sponsors many public policy forums. They include an institute to update legislators on pressing policy issues; a roundtable series for national and state experts targeted at specific policy issues (e.g. environment, education); and public policy debates on current policy issues.

The institute has a statewide advisory board composed of leaders from the community, government, industry, education, and the press.

Achievements and/or Future Directions. The innovative, participatory approach taken by the institute and the other consultants for the Arizona Strategic Planning for Economic Development (ASPED) project has been praised nationally. The project, having gained initial support from the governor, is expected to be the basis for Arizona economic and social policy decision making during this decade and beyond.

Contact Person. Rob Melnick, Director, Morrison Institute for Public Policy, School of Public Affairs, Arizona State University, Tempe, AZ 85287-4405, (602) 965-4525.

7. Utah Partnership for Educational and Economic Development (Utah)

In 1990, the Utah Partnership for Education and Economic Development was established by the Utah Task Force on Education and Economic Development. The task force, a group of business, education, and government representatives appointed by the State Board of Regents, the State Board of Education, and the Department of Community and Economic Development, sought to create a partnership that would examine how education can increase its contribution to the health of the state's economy.

The partnership is described as a "catalyst in helping business, government, and education leaders to improve education and strengthen Utah's economy." It has a 25-member board of trustees and five working committees. The committees are charged with examining ways to (1) match training and education with market needs; (2) identify and

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[5] For more information on *Arizona at the Crossroads*, see the WICHE publication, *Joined or Unconnected? A Look at State Economic Development and Higher Education Plans, Working Paper #5.*

match the needs and resources of education and business; (3) communicate Utah's economic, educational, and cultural assets to the public; (4) improve basic education at all levels; and (5) enhance research and development.

Partnership initiatives that have been implemented include:

(1) The 1990 legislature allocated $15 million to the Educational Technology Initiative (ETI), a joint effort of education, business, government, and high technology to expand the use of educational technology. With the legislative appropriation and other grant monies, $37.3 million has been applied toward equipment acquisition and teacher training in the use of new technologies in the classroom.

(2) The Utah Partnership helped articulate several key strategies of the 1992-97 Utah State Public Education Strategic Plan, in part by serving as "a clearinghouse for dissemination of information and as a facilitator of business-school partnerships statewide."

(3) In May 1992, the partnership hosted a conference for approximately 300 business leaders to discuss the current higher education access dilemma. The goal is to sensitize business groups to the current problems of limited funding and rapidly growing enrollment pressures for public higher education.

Staffing responsibilities for the partnership are shared by Department of Community and Economic Development, the State Board of Regents, and the State Board of Education.

Achievements and Future Directions. The five working committees of the Partnership continue to work on specific statewide plans, while promoting the development of business-education partnerships at regional and local levels.

Contact Person. Don Carpenter, Associate Commissioner for Planning, Utah System of Higher Education, State Board of Regents, 355 W. North Temple, 3 Triad Center, Suite 550, Salt Lake City, UT 84180-1205, (801) 538-5247.

8. **Total Quality Improvement in the North Dakota University System** (North Dakota)

The Total Quality Improvement (TQI) movement in North Dakota is unlike any other program in this report. It does not fall strictly into a partnership or outreach category and it is a university initiative that has led to state involvement rather than the other way around. More commonly referred to as "Total Quality Management," TQI is an internationally-known management approach that has been adopted in business and industry and is beginning to take hold in the higher education community. The North Dakota University System is the first statewide higher education system to adopt TQI as its principal reform strategy. Adopted in 1989 and central to the system's seven-year plan

Partners for Progress, TQI methods are being implemented by the state's public colleges and universities and by the State Board of Higher Education.

The primary goal of TQI is to increase quality, productivity, and teamwork and to decrease cost. It involves examining and improving work processes by focusing on the needs of the customer (i.e., the student), using flow-charting and other tools to make systematic improvements, developing group responsibility for quality improvement, and committing to quality at each step. TQI emphasizes a continuous process of team-work and problem-solving.

Most of North Dakota's campus efforts have focused on teaching the TQI rationale and methods to faculty, administrators, and staff. Institutions have undertaken some initial activities such as collecting baseline data and surveying students and other users of university services. For example, Dickinson State University has changed policies and practices in university relations, admissions, and student affairs, resulting in quicker response time to work requests and reduced paperwork; and by changing its process for hiring workstudy students, North Dakota State University, Bottineau has reduced paperwork and hiring time. Using TQI principles, the North Dakota Board of Higher Education changed campus reporting practices, giving campuses final authority for decisions that formerly needed board approval.

Higher education's adoption of TQI has led to some new partnerships among higher education, business, and state and local government. Local elected and appointed officials have approached the North Dakota University System to learn how to implement TQI principles in local governance. One campus has co-founded the Community Quality Council which brings together representatives from business, higher education, and city government to discuss implementation of TQI methods in all three sectors. In addition, the governor has established a quality coordination committee that will "develop and update regularly a strategic plan to coordinate total quality management implementation throughout North Dakota State Government." The committee includes legislators and a higher education representative.

The North Dakota Board of Higher Education requested and received a special legislative appropriation of $150,000 for 1991-93 for TQI efforts. Each campus president or executive dean is responsible for implementing TQI. The chancellor of the university system is responsible for overseeing TQI on campuses and implementing it in the system office.

Achievements and/or Future Directions. Campuses are just beginning to implement TQI. They have found it easier to translate TQI principles into administrative practices than into teaching methods, but it applies to both. Convincing faculty that the principles can apply effectively to the classroom may be a challenge for some campuses.

Demand for TQI training continues to swell in both the public and private sectors. Demand for a series of recent TQI conferences was so great that three additional conference sites were added.

Contact Persons. Ellen Chaffee, Vice Chancellor for Academic Affairs, North Dakota University System, State Capitol Building, 600 East Boulevard, Bismarck, ND 58505, (701) 224-2960 or Russ Poulin, (701) 224-2964.

9. **Spokane Intercollegiate Research and Technology Institute** (Washington)

Established in 1989 by the Washington legislature, the Spokane Intercollegiate Research and Technology Institute (SIRTI) is a regional resource center promoting partnerships between industry and eastern Washington higher education institutions. SIRTI helps coordinate the high technology training and research conducted at five colleges and universities: Community Colleges of Spokane, Eastern Washington University, Gonzaga University, Washington State University, and Whitworth College. It is funded by the state and by private industry.

SIRTI was designed to coordinate research and development (R&D) efforts; match industry needs with the knowledge and expertise of faculty, scientists, and technicians; use computer networking and telecommunications systems to link businesses, researchers, and developers; and offer academic programs. The institute has fostered the establishment of a number of R&D centers on the five campuses. SIRTI houses a Center for Entrepreneurship to serve the long-term entrepreneurial needs of eastern Washington. In the short run, it will provide practical and academic support to entrepreneurs. The center is an outgrowth of Eastern Washington University's Small Business Institute.

SIRTI's recent activities include hosting two conferences: one on marketing inventions and the other on environmental technologies.

Achievements and/or Future Directions. Construction of a permanent SIRTI facility will be complete in winter 1993. It will house applied research and product development laboratories, business assistance centers, state-of-the-art interactive electronic classrooms, and administrative offices.

Contact Person. Gordon R. Bopp, Executive Director, SIRTI, West 601 First Avenue, Spokane, WA 99204-0324, (509) 456-6176.

IV. SMALL BUSINESS OUTREACH

While large-scale research agreements typically are made between large urban research universities and corporations, both rural and urban institutions are involved in small business outreach in the form of small business development centers, business institutes, and business incubators (AASCU, 1989). Most of the programs described below receive federal funding, are housed in a university's college or school of business, involve faculty and/or students in outreach efforts, provide training programs, and tend to focus on individual business rather than broader state economic needs.

As the primary economic base of many rural areas has shifted from agricultural production to entrepreneurial and small business endeavors, the public service mission of land-grant institutions has adjusted to meet new demands. In response to the need for small business management assistance and counseling, many campuses house Small Business Development Centers (SBDCs) funded by the U.S. Small Business Administration (SBA), the state, and the university. SBDCs were established as early as 1977 and are now located in nearly every state. The SBA spends approximately $60 million to support over 700 centers nationwide; there are 230 SBDCs in the WICHE region. The centers typically employ a director and a small staff. University faculty and students often work with the center in analyzing businesses, conducting market research and providing other specialized assistance.

Business incubation is a concept that has grown popular since the mid-1980s; there currently are at least 400 incubators in the country. An "incubator" refers to facilities and services provided at low cost by established businesses, universities or economic development agencies to nurture new businesses. Often new businesses are provided office space, secretarial support, and business expertise. Incubators improve the chances for success of start-up businesses (Feeser and Willard, 1989).

For the most part, universities have started business incubators to help faculty, students, or researchers to develop and market new products and technologies (Campbell and Temali, 1984). However, the two incubator programs described here (the Business Education Institute's Enterprise Development Center and the Spokane Business Incubator) assist start-up businesses outside of the university.

10. **Business and Education Institute** (South Dakota)

Dakota State University started its Business and Education Institute (BEI) in 1985 to provide business outreach services throughout the state. BEI assists businesses and communities with the development of goals and strategies and conducts job training and computer training, software development, and systems analysis. BEI receives more than 80 percent of its funding from grants, contracts, and fees charged for services. One BEI program, the Center for Innovation, Technology and Enterprise (CITE), was founded by the Governor's Office of Economic Development in 1987 and is funded by South Dakota's Futures Fund.

The institute conducts surveys of the South Dakota economy, creates reports, and develops services and courses. In 1988 BEI conducted an economic impact study showing the positive economic effect of South Dakota's six public higher education institutions on the state's economy. It also has assessed individual communities for their attractiveness to new businesses and assisted them in developing a better economic edge. BEI assists communities in surveying and assessing their residents to determine community strengths and preferences for development. The following represent a range of the many BEI projects.

BEI coordinates the Center for Innovation, Technology, and Enterprise (CITE) programs at South Dakota's six public colleges and universities. CITE programs link higher education faculty and staff with private industry to promote technology transfer.

The Enterprise Development Center (EDC) assists new, innovative business start-ups. Its short-term goals are to encourage economic revitalization by supplying rental space, light manufacturing facilities, support staff, and basic office service on a per-use basis. It targets product-oriented service companies (such as computer software), service, non-retail, and technology industries, and light manufacturing. University faculty provide business management and technical counseling, as well as access to experts and information.

Another program, the Institute for Entrepreneurial Development (IED), supports entrepreneurial and economic development efforts of students, faculty, and staff. IED coordinates and assists in the delivery of business and technical consulting. It sponsors speakers, workshops, and conferences; provides access to technical and clerical support; and provides training courses in entrepreneurship.

The Small Business Innovation Research Center (SBIR), started in 1988, helps small businesses receive federal research and development contracts. SBIR helps companies identify research topics in their field, supplies information on previous contract winners and proposals, and assists in preparing and submitting proposals. It helps businesses network with government staff and other resource people, and provides on-line information on relevant technical reports or expert personnel. If a proposal is successful, SBIR helps the firm through the contract process, facilitates working relationships with university faculty who have relevant expertise, and assists in the commercial development of products initiated through an SBIR contract.

The Job Training Institute (JTI), started in 1986 in cooperation with the South Dakota Department of Labor and the University, provides competency-based training programs. Its two objectives are to provide area residents with technical training in office-related occupations (including computer skills, bookkeeping and accounting, business communications, and word processing), and to provide employers with employment services and a large pool of technically skilled applicants trained in a variety of clerical fields.

Achievements and/or Future Directions. BEI's success is measured by the large number of repeat clients and new areas that it has been invited to explore. The staffing, number of projects, and total business volume have increased each year.

Contact Person. Francis McGowan, Director, Business and Education Institute, Dakota State University, Madison, SD 57042-1799, (605) 256-5555.

11. **Center for Business and Economic Research** (Nevada)

The Center for Business and Economic Research, started in 1975, provides a wide range of services to local and regional businesses, the University of Nevada, Las Vegas, and various state and federal organizations. The center collects, analyzes, and disseminates economic and business information about metropolitan Las Vegas and the state of Nevada, and provides technical expertise and research services to support economic diversification. It receives about one-sixth of its annual funds from the state; the remainder comes from grants and contracts.

The center's research and analysis services include mail and telephone surveys, focus groups, personal interviews, and on-line access to regional and federal government statistics. In addition, the center maintains computer models of the state of Nevada and its sub-regions for forecasting different economic scenarios depending on industry variables. The center also analyzes how market conditions affect investment decisions.

The center, associated with the College of Business and Economics of the University of Nevada, Las Vegas, also provides a training ground in business and economics for undergraduate and graduate students. Their training includes helping faculty and staff conduct and tabulate survey results and develop computer databases used in economic forecasting. The faculty of the College of Business and Economics also conduct marketing research, economic analyses, and management planning for the center.

Achievements and/or Future Directions. A consortium of Nevada economic development organizations has selected the center since 1980 to conduct the yearly community-wide survey that charts and analyzes the recent dramatic growth of Las Vegas. Results are published in the annual *Las Vegas Perspective*, a compendium of information used to help local firms and attract corporations throughout the country to expand or relocate operations to the area.

The center has completed studies that have influenced state and local policy on issues such as the following:

(1) The short- and long-term economic effects of water availability on the Las Vegas and southern Nevada regions.

(2) The current health insurance coverage of Nevada's population.

(3) The effects on local growth and economic development brought about by the U.S. nuclear repository site at nearby Yucca Mountain.

(4) The employment and income impacts of major new state projects.

Contact Person. R. Keith Schwer, Director, Center for Business and Economic Research, University of Nevada, Las Vegas, 4505 Maryland Parkway, Las Vegas, NV 89154, (702) 739-3191.

12. **Idaho Small Business Development Center** (Idaho)

Small businesses comprise 97 percent of all business establishments in Idaho and employ 43 percent of workers. To assist these businesses, Idaho has six regional small business development centers located at public colleges and universities throughout the state. The state administrative office is located at Boise State University's College of Business. Funding is from the U.S. Small Business Administration, the Idaho State Department of Education, public colleges and universities, and public and private donations and grants.

Initiated in 1986, the center at Boise State University provides consulting, training, and research services to small businesses statewide. Counselors emphasize long-range planning and identifying specific individual clients' needs. Training is usually in the form of short-term, non-credit seminars and workshops on computer usage, business planning, and marketing. Research activities include designing surveys, performing database searches, and preparing industry profiles for business plans.

The center also offers Small Business Innovation Research (SBIR) Support Services. SBIR is a research and development program supported by federal agencies and is designed to encourage small businesses to participate in government research projects. SBIR awards more than $400 million per year to small businesses. However, a recent analysis found that western states other than California received few SBIR awards. The Idaho Center's SBIR Support Services assists with technical writing, counseling, planning, and database searches to increase the number of proposals submitted by Idaho small businesses.

Achievements and/or Future Directions. The center's success is measured by the large volume of clients served in the past year. The center will continue to provide effective, direct counseling and training services to individual small businesses in Idaho.

Contact Person. Ronald R. Hall, State Director, Idaho Small Business Development Center, Boise State University, College of Business, 1910 University Drive, Boise, ID 83725, (208) 385-1640 or (800) 225-3815.

13. **Small Business Development Center Network** (Hawaii)

The University of Hawaii at Hilo Small Business Development Center Network (SBDCN) was established in 1990 to provide university-based management assistance to small businesses. The network has four full-service offices on four of Hawaii's major islands, funded cooperatively by the U.S. Small Business Administration and the university.

The overall objective of SBDCN is to strengthen the small businesses that comprise over 98 percent of all Hawaii business firms and employ some 60 percent of the private sector work force. SBDCN's priorities are to meet management and technical needs; contribute to economic growth; and assist more small businesses than is possible with federal monies.

Each network office has a resource center which provides a complete line of periodicals, books, videos, tapes, and on-line computer search capabilities. In conjunction with informational resources, SBDCN conducts conferences and business training workshops. Network staff, university faculty, and volunteers provide free individual consulting services to business owners to help them get government and other contracts. SBDCN also is a resource for contacts and referrals.

Achievements and/or Future Directions. During the first two years of operation the network has provided business consulting to more than 1,000 businesses throughout Hawaii. In addition, more than 1,600 persons have attended workshops and seminars sponsored by the SBDCN. The network expects its consulting services to expand over the next five years.

Contact Person. Janet M. Nye, University of Hawaii SBDCN, 523 West Lanikaula St., Hilo, HI 96720, (808) 933-3515.

14. **Minnesota SURE Access** (Minnesota)

Minnesota State University Research Enterprise (SURE) Access, based at St. Cloud State University, is an electronic catalog that makes the resources of the Minnesota State University System available to individuals, organizations, communities, government agencies, and businesses. Serving as a broker, SURE Access links university expertise to the needs of clients for consulting, research, training, education, new business development, technology transfer, and product or service development and enhancement. It was created in response to a 1987 legislative challenge to state agencies and organizations to take a proactive role in meeting the state's economic development needs. It is funded by the university system and by a corporate sponsor.

Resources in the database represent a broad range of expertise from arts and humanities to marketing and engineering. SURE Access has responded to a variety of client requests including assistance with foreign language translation, affirmative action plans, business expansion, traffic engineering, computer language training, quality improvement, crisis

management, and waste reduction. Most SURE Access clients are individuals, entrepreneurs, or small business people in Minnesota.

SURE Access partners with other economic development providers including small business development centers, business institutes, and innovation centers, to provide a broad range of resources to clients. Access is gained through a toll-free number. Each of the seven state universities has a local SURE Access coordinator.

Achievements and/or Future Directions.

Since its inception it has responded to nearly 1,200 assistance requests. Efforts are underway to expand SURE Access to include the resources of Minnesota's technical and community colleges.

Contact Person. Jane DeAustin, Minnesota SURE Access, Administrative Services 210, St. Cloud State University, St. Cloud, MN 56301, (612) 255-3949.

15. **Montana Entrepreneurship Center** (Montana)

In 1990 the Montana Entrepreneurship Center was established to support entrepreneurship and business development. The center is headquartered at the University of Montana and has branch offices at Montana State University and Eastern Montana College. The center links entrepreneurs and businesses with the research, facility, and equipment resources of the six-campus university system, and with those of the public and private sectors as well. The center responded to over 1,800 requests for business assistance in its first 18 months of operation. It is funded by the Montana Science and Technology Alliance, a state public agency that grants seed money to centers of excellence, with matching funds from private grants.

In Montana, as in many rural states in the West, entrepreneurism and small business ventures have grown increasingly important as a result of shrinking manufacturing and natural-resource based industries. Small businesses employ nearly 68 percent of all workers. The Montana Entrepreneurship Center was founded to meet the increasing needs of entrepreneurs and businesses by providing services that include start-up counseling and assistance with loan applications; linking clients with a database that provides access to a broad range of university, public, and private resources; and access to information on capital opportunities.

The center provides three additional services to approximately 100 economic development and business assistance organizations. The first is an electronic network that allows business assistance providers access to the center's database. The second is an electronic business calendar of conferences, seminars, and business activities throughout the state. A third service links economic development specialists through an electronic conferencing system which allows these specialists to share concerns, pose questions, and discuss critical issues.

Achievements and/or Future Directions. The center is working with the Montana Private Capital Network to establish a network that will match entrepreneurs who need capital for start-up and expansion with subscribers who are willing to invest money and perhaps time and expertise in Montana companies.

Contact Person. Kay Lutz-Ritzheimer, Executive Director, Montana Entrepreneurship Center, Central Office, Suite 204, McGill Hall, University of Montana, Missoula, MT 59812, (406) 243-4009.

16. **Spokane Business Incubator** (Washington)

Eastern Washington University is responsible for the management and fiscal operation of the Spokane Business Incubator. Established in 1985, the incubator has two business clusters: an office cluster, which provides space for up to 22 businesses, and the Kitchen Center, a licensed food-production facility for small businesses. The incubator program has served 117 businesses since it began; tenant businesses have had an 83 percent success rate. In its first year the incubator was funded by the state and the federal government through the Job Training Partnership Act (JTPA); it now receives funding from Eastern Washington University.

The Spokane Business Incubator offerings include office space, utilities, business and financial planning, accounting, marketing counseling, administrative support, equipment, computer services, and technical and enterprise matching. The Kitchen Center is a fully equipped, licensed facility.

The incubator is administered by an executive board of community leaders appointed by Eastern Washington University. The incubator director and staff are all employees of the university. Students assist with incubator operations.

Achievements and/or Future Directions. The Spokane Business Incubator is the first incubator to have a shared food processing facility. In the future, there are plans to enlarge the incubator program to include light manufacturing and high tech businesses.

Contact Person. Tom Showalter, Spokane Business Incubator, Spokane International Airport Business Park, South 3707 Godfrey Blvd., Spokane, WA, 99204-5753, (509) 458-6340.

V. TECHNOLOGY TRANSFER AND WORKFORCE TRAINING

Technology transfer and workforce training programs are defined here as cooperative arrangements among industry, higher education, and/or government, that are responsible for basic and/or applied research, technology transfer, and workforce training. This broad definition includes research transfer and activities associated with commercializing research or improving relations between the university and industry, such as continuing education or industry-sponsored research (Matkin, 1990). Most programs in this category have adopted interdisciplinary approaches to technology development and transfer and workforce training, and conduct a range of teaching, research, and public service activities.

As opposed to research centers and training programs that are housed primarily at four-year institutions, specialized technical workforce training for the most part is provided by community colleges. It became increasingly common in the early 1980s, when business firms began contracting with community colleges to provide customized training. Some have argued that by entering into these contracts, community colleges are becoming too "privatized" and focused on short-term technical skills instead of long-term general knowledge. Others contend that this concern is balanced by the valuable contribution these alliances make to economic revitalization (e.g., corporate relocation to a community where customized training is available), the resulting strong business-college relationships, expanded community college access, and the obvious financial benefit to both businesses and colleges (Kopecek and Clarke, 1984, p. 12-13).

17. **Engineering and Environmental Research Center** (South Dakota)

South Dakota State University's Engineering and Environmental Research Center (EERC) was started in 1986 to enhance the research capabilities of the College of Engineering, to provide technical and scientific support to industry, and to contribute to economic development. Funded by a combination of federal, state, and local monies, the center is composed of five programs: (1) Engineering Experiment Station; (2) Office of Remote Sensing; (3) South Dakota Space Grant Consortium; (4) Transportation Technology Transfer Service; and (5) University/Industry Technology Service. This description focuses mostly on the latter program, University/Industry Technology Services (UITS).

UITS arranges contacts and referrals for cooperative research projects between industry and university faculty. Students and faculty from the College of Engineering have participated in several UITS-arranged design projects, of which seven have received partial funding from the South Dakota Future Fund. Projects have ranged from designing a weight cart for heavy duty motor equipment, to designing a wheelchair lift for access to fishing and recreation.

In addition to arranging for research support, UITS has held five symposiums for industry which targeted cooperative problem-solving. Three additional symposiums brought together technology providers and people interested in economic development. UITS also sponsors symposiums and workshops to assist industry in Total Quality Management

training, as well as video teleconferences about increasing manufacturing efficiency, economic development, and computer applications. Since 1988 UITS has made more than 1,950 contacts with South Dakota firms, including 200 on-site visits, and has assisted some 109 businesses, including 65 projects that have involved university faculty from 21 departments.

UITS is guided by a 17-member advisory council, composed of South Dakota leaders from industry and commerce. UITS cooperates and works extensively with other programs and agencies, such as: the University's Small Business Opportunity Center and its Center for Innovative Technology Entrepreneurship; the Governor's Office of Economic Development; and various industrial and commercial associations, including the Association of General Contractors, Industry and Commerce Association, Chambers of Commerce, and the Brookings Development Corporation.

The other EERC programs provide technical information, technical assistance, and technology transfer. The Engineering Experiment Station (EES) coordinates all research at the College of Engineering. The Office of Remote Sensing uses multi-spectral sensing to study the earth's surface, does resource mapping for South Dakota, the nation, and some foreign countries, emphasizes the use of geographic information systems in its research and training programs, and offers short courses and resource analysis. The Transportation Technology Transfer Service helps local governments by providing training workshops, a newsletter, and information dissemination via print, video, and toll-free telephone. The South Dakota Space Grant Consortium is a cooperative project among the South Dakota School of Mines and Technology, South Dakota State University, and the EROS Data Center; its mission is to enhance South Dakota's aerospace R&D infrastructure through fellowships, scholarships, and research projects.

Achievements and/or Future Directions. UITS received the National Association of Management and Technology Assistance Center (NAMTAC) Project of the Year Award in 1990. Also in 1990, its Webster Scale project (design of a new weight cart for trucks) received second place in the technology transfer category. The UITS program also was cited as a successful university center focusing on technology transfer by the U.S. Assistant Secretary of Commerce for Economic Development at the annual meeting of the Technology Transfer Society.

Contact Person. LaDell Swiden, Acting Director, Engineering & Environmental Research Center, South Dakota State University, Box 2220, Brookings, SD 57007-2220, (605) 688-4184.

18. **Optical Sciences Center** (Arizona)

The University of Arizona's Optical Sciences Center, founded in 1967 through a U.S. Air Force Grant, is a center of expertise and technical development in optics. The center has strong links with area and national industries and its faculty and students conduct extensive theoretical and applied research. Currently the program is funded annually for

about $1.9 million by the state of Arizona and approximately $10 million a year from external grants and contracts. The center is headed by a director who also serves as chairman of the Department of Optical Sciences. It has its own faculty as well as faculty jointly appointed to the optical sciences department and other academic disciplines.

Since its founding, the Optical Science Center has awarded more than 450 Ph.D. and M.S. degrees in optical sciences and has grown to 40 faculty and 150 graduate students. In 1989 an undergraduate degree in Optical Engineering was established. The degree programs prepare students to enter industry and academic careers in optics and electro-optics. Graduates of the center have established a number of small firms in metro Tucson.

The center's research expertise encompasses virtually all topics related to the use of light as an imaging, communicating, or processing medium. Recent work includes developing methods for making and testing large aspheric optical components; investigation of semiconductors using special techniques; growth of very fast optical switching devices; and many innovative methods of medical image processing and automated diagnosis.

In addition to contract and collaborative research, two programs address specific research areas: the Optical Data Storage Center and the Optical Circuitry Cooperative. Funded partially by industry, these two programs give companies the chance to impact the focus of center research, and offer special patent opportunities. A third program is the Industrial Affiliates Program through which companies contribute fees to support teaching, equipment, and graduate student research.

Achievements and/or Future Directions. The center has an international reputation as a leader in optics expertise and technology , and is recognized for continuing work in remote sensing, medical optics, and laser applications.

Contact Person. Robert R. Shannon, Director, Optical Sciences Center, University of Arizona, Tucson, AZ 85721, (602) 621-6997.

19. **Project S.U.C.C.E.S.S** (Hawaii)

Project S.U.C.C.E.S.S. (Sheraton's Unified Commitment Concerning Employee's Self-Success), established in 1989, is a workplace literacy partnership between the ITT Sheraton Hotels of Hawaii and the University of Hawaii at Manoa. Its objective is to improve work skills in an increasingly underskilled work force by offering education in English as a second language (ESL), literacy, and basic reading, writing, and mathematics. Approximately 750 ITT Sheraton employees have participated in the program, of whom a majority are from diverse racial or ethnic backgrounds. The project is funded by the U.S. Department of Education, Office of Vocational and Adult Education ($189,000), with matching funds from the ITT Sheraton Hotel chain. In 1990 it received a second grant ($273,063), and has expanded from its first site serving four Sheraton Hotels to three other Sheraton Hotels in other parts of Hawaii.

The main objective of the project is to provide literacy skills needed in the workplace. Most adults with inadequate basic skills are found at the lower employment levels and these employees form the core group of students. The training enhances employees' skills and self-esteem, which in turn benefits the business by significantly improving employee performance and self-confidence.

The College of Education trains instructors and tutors in multicultural education, individualized instruction, and adult learning. The program provides group, computer-aided and one-on-one instruction. Participants are assessed to determine their needs and literacy levels and instructors design individualized instruction programs.

The program is free to employees on a voluntary basis. The courses are open entry, open exit, with no time limit for course length. Training takes place at the hotel's Human Resources Training Center, which is open and staffed by instructors daily.

S.U.C.C.E.S.S. collects evaluation data on teaching methods and results on a daily basis; results are evaluated every three months and at the end of the grant period. Supervisors report that more than two-thirds of the participants have shown dramatic improvement in work attitude, confidence, attendance, customer relations skills, safety practices, work efficiency, and job productivity. Six participants have received promotions, three participants have received their GED, and four have started courses at a community college.

The Project Advisory Council's nine members include top Sheraton executives, state education department specialists, university faculty and administrators, the Governor's Council for Literacy, and various adult education experts. Project staff include a director, two project coordinators, a secretary, a full-time instructor, and 31 tutors recruited from hotel staff and community organizations.

Achievements and/or Future Directions. As intended, Project S.U.C.C.E.S.S., Hawaii's first workplace literacy program, has served as a model for the creation of similar programs in the state. Hawaii was recognized as a leading state in combatting illiteracy at a recent Governor's Council for Literacy Conference.

Contact Person. Lawrence Zane, Ph.D., Project Director or Ms. Anita Li, Project Coordinator, University of Hawaii at Manoa, College of Education, Wist Hall 216, 1776 University Avenue, Honolulu, HI 96822, (808) 956-7834.

20. **Labor Education and Research Center** (Oregon)

The University of Oregon's Labor Education and Research Center (LERC) was established in 1977 by the Oregon Legislative Assembly to provide labor leaders with the knowledge and skills to improve management relations. Its staff conducts labor research and conferences, institutes, workshops, and short courses. Between 1987 and 1989, LERC nearly tripled its course offerings, providing more than 100 programs for some 3,800 people

throughout Oregon. Of LERC's 1990-91 income, approximately two-thirds came from the state's general fund appropriations and the rest from fees, contracts, and grants.

LERC is administered by a professor and a director, and has six faculty members and several advisory committees. Labor, management, the university, and professional organizations all provide advisors to the center.

The center has been involved in a number of research, teaching, and public service activities. To expand its research and initiate curriculum on the international economy and labor, it ran a U.S.-Canadian conference on Labor in a Global Economy in 1990; it received a state grant to provide education and training in the forest products sector, thereby expanding its work in occupational safety and health; it has a well established labor-management curriculum, and recently began new programs with Kaiser Permanente and the State of Oregon; it has developed new leadership programs, including an occasional Labor Forum in Portland and classes in leadership, communications, and strategic planning; and it conducts educational conferences and classes in topics such as grievance handling, collective bargaining, and arbitration.

Many of LERC's programs are responsive to business and labor sector requests and needs. The center provides programs to joint labor-management groups, such as conferences on labor-management cooperation, labor law, safety and health, and work force development. At the request of Oregon's AFL-CIO, LERC cooperated in producing the first Labor School for High School Students, a four-day summer intensive seminar for 30 students held at the University of Oregon. In 1990, LERC held its first Women's Institute for Leadership Development for 70 women. To reach out to placebound workers throughout the state, LERC introduced the weekend Regional Leadership Academies.

LERC also supports Oregon state public policymakers and works with agencies in work force training, education reform, and labor-management relations.

Achievements and/or Future Directions. LERC is recognized as a major program in the State of Oregon's new policies on education reform and work force development. The Governor appointed the Center's director to the Workforce Quality Council, a high-level council that will oversee new education and economic development policies.

Contact Person. Margaret Hallock, Director, Labor Education and Research Center, University of Oregon, 1675 Agate St., Eugene, OR 97403-1289, (503) 346-5054.

21. **Public Utility Research and Training Institute** (Wyoming)

Established in 1989, the Public Utility Research and Training Institute (PURTI) at the University of Wyoming provides training opportunities and research information to a wide range of state public utility providers and regulators. PURTI is housed in the University's Department of Economics and Finance and is funded by corporate and government sponsors.

Three times a year the institute produces *PURTI Research Summaries*, a publication designed to provide regulatory commissions and other public utility organizations easy access to academic studies and other information published in academic or technical journals. The publication summarizes articles from 36 journals in regulatory and public utility economics and related disciplines.

The institute also offers training courses to public utility employees. An annual one-week training course called "The Changing World of Public Utility Economics" provides enrollees with updates on economic and regulatory principles. Other courses offered include a condensed version of a college course on the economics of public utility regulation, a conservation and environmental externalities course, and a course for high school teachers on the basic economics of public utility regulation.

PURTI also provides sponsoring organizations a bibliography service on specific utility-related topics.

Achievements and/or Future Directions. Since 1989 PURTI has doubled the number of training courses offered and increased its number of corporate sponsors.

Contact Person. Curtis Cramer, Professor, Department of Economics and Finance, PURTI, P.O. Box 3985, University of Wyoming, Laramie, WY 82071-3985, (307) 766-2253.

22. **Maricopa County Community Colleges/Centers** (Arizona)

Since its establishment in 1962, the Maricopa County Community College District has grown from one to 11 community colleges/centers. It is recognized nationally for its strong academic programs, high student transfer rates to four-year degree programs, and innovative alliances with industry. Maricopa is the second-largest community college system in the nation and the largest higher education provider in Arizona.

A variety of customized employee training programs are offered at Maricopa community colleges. One is Motorola University West, established in 1991 through a partnership between Mesa Community College and Motorola. Motorola and the community college district have had a long-standing cooperative relationship in providing employee education and training; Motorola University was established because the employee classes outgrew a former training area. The university provides customized education and training, ranging from automotive technology to literacy skills.

General Motors (GM) and Glendale Community College have created a similar kind of partnership. Students are trained in automotive technology through the General Motors Training Center (GMTC); the college provides instructors and GM provides students with textbooks, service guides, model automobiles, and access to a resource library. The Maricopa County Community Colleges District has a similar partnership with Toyota.

More than three-quarters of the students attending Maricopa community colleges are employed (one-half of them are employed full-time). The student body is nontraditional: most are employed, over 30 years of age, predominantly female, and come from racially or ethnically diverse backgrounds.

Achievements and/or Future Directions. The Maricopa County Community College District will continue to develop and strengthen ties with industry. It expects to serve greater numbers of students as Arizona enrollments swell and students increase their reliance on community colleges for their first two years of study before transferring to four-year degree programs.

Contact Person. Bertha Landrum, District Director of Occupational Education and Economic Development, Maricopa Community College District, 2411 West 14th Street, Tempe, AZ 85281-6941, (602) 731-8203.

VI. RURAL OR UNDERSERVED POPULATION OUTREACH

Rural America's economic conditions have worsened over the past two decades. Unemployment and poverty rates exceed national averages by more than 30 percent and an increase in the number of elderly has enlarged dramatically the need for health care. Furthermore, as the economy moves from dependence on agriculture, rural regions struggle to provide employment opportunities and access to health care and higher education.

Colleges and universities have responded to rural needs in a number of ways, including: (1) small business assistance programs that address business needs; (2) federally supported Area Health Education Centers (AHECs) which were established, in part, to increase the number of health care practitioners in rural areas; (3) programs such as the Central Oregon Consortium for Higher Education that create rural access to four-year degree programs.

Rural access to technical and academic degree programs is expanded through the use of telecommunications. According to the Western Cooperative for Education Telecommunications (WCET), every state in the WICHE region has invested to some degree in educational telecommunications services. Some states, such as Hawaii and Utah, have highly developed state telecommunications systems designed to deliver educational services to communities throughout the state. Telecommunications plays an important role in higher education's overall strategy for meeting the needs of rural communities, and the life-long educational needs of the workforce.

A 1989 Western Governors' Association report notes the lack of information on successful rural outreach programs: "Models that can be emulated tend to be few, at least evidence of the presence of success is sparse, and their general application to other settings is limited" (WGA, 1989). The rural outreach programs described here target the needs of specific state or regional populations. They also receive funding from their home state and/or the federal government.

Just as higher education access for rural populations is critical to economic development, so is the recruitment and retention of historically underserved populations (non-White or Latino). The current and projected dramatic growth of racially and ethnically diverse populations is well-documented. By the year 2000, "nearly one-third of the school- and college-age population will be non-White/Latino" (WICHE, 1991). *Workforce 2000* reports that racial and ethnic minorities will make up close to 29 percent of net additions to the workforce between 1985 and 2000. Higher education and training for these historically underrepresented groups is critical to the economy.

Hundreds of programs target specific minority populations to improve student college participation and success rates and encourage particular career paths. Successful programs have in common targeting the needs of a particular constituency, clearly stated goals and objectives, and support from institutional and external funds (WICHE, 1989).

23. **Alaska Native Health Career Program** (Alaska)

In 1974 the Alaska Federation of Natives established the Alaska Native Health Career Program to recruit, train, and retain Alaska Natives in the health care professions. At that time Alaska as a whole, but especially its rural areas, suffered from a severe shortage of health professionals. Alaska Natives had little access to health care, and no known Alaska Natives were practicing medicine, optometry, dentistry, veterinary medicine, pharmacy, or public health. The federation designed a five-year plan to take over the state's Indian Health Service hospitals under the Indian Self-Determination Act, and initiated the health career program to address the shortage of Alaska Native health professionals.

Alaska Native students who were enrolled in colleges throughout the U.S. came home to work in their own Alaska Native Health Corporations under the supervision of a doctor or dentist. In 1975, 13 students took part in the traineeship program; all are now active professionals. Since that small beginning, some 240 students have participated in Alaska Native Health Career Programs. Now more than 45 Alaska Natives practice medicine, optometry, dentistry, veterinary medicine, osteopathy, pharmacy, and public health, of whom 75 percent were Health Career Trainees. Funding has come from the Bureau of Indian Affairs, the federal Indian Self-Determination Act and Indian Health Care Improvement Act, federal health manpower and nursing grants, and the University of Alaska.

The health career program has expanded and now functions as an umbrella organization to raise funds and coordinate health career projects sponsored and guided by a partnership between the Alaska Federation of Natives and the University of Alaska. The Alaska Native Health Board provides follow-up to support students and ensure their continued access to resources throughout college.

The most comprehensive project under the Health Career Program is the Della Keats Summer Enrichment Program. Started in 1979 at Alaska Methodist University, it has since branched out to a number of University of Alaska campuses. Each summer Alaska Native high school juniors and seniors who are interested in the health professions attend a six-week enrichment program in math, science, and English to prepare for college. In addition, each student receives career counseling and information about financial aid and college admissions.

Achievements and/or Future Directions. Individual Alaska Native Corporations, the Alaska Native Health Board, and the Alaska Federation of Natives have commended the Alaska Native Health Career Program for increasing the number of Alaska natives practicing in health professions in rural Alaska. The program is planning to submit a proposal with the University of Washington School of Medicine to develop a Northwest Indians in Medicine Program (INMED), that would include Alaska, Idaho, Oregon, and Washington.

Contact Person. Katherine A. Johnson, Director, Alaska Native Health Career Program, 3211 Providence Drive, Allied Health Sciences Building, Room 151, Anchorage, AK 99508, (907) 786-4644.

24. **Regional Services Institute** (Oregon)

The Regional Services Institute, located at Eastern Oregon State College, was established to provide "applied research and public service assistance" to educate and serve 10 rural counties in eastern Oregon. The institute has engaged faculty, students, and staff in community outreach and resource sharing projects. Statutorily authorized in 1979, the institute is funded by the state, by federal grants and contracts, and by other grant monies.

The institute is both reactive and proactive in nature, providing a range of services from assistance in grant writing and market analysis to leadership training and public surveys. Six programs are available:

(1) Community Development—The objective of this program is to respond to requests for assistance from businesses, the public sector, and entrepreneurs in rural Eastern Oregon. The responses include locating useful resources, accessing databases, research and survey assistance, and grant writing assistance.

(2) Rural Diversification Program—This program aids local governments and communities in developing a healthy business climate in order to attract private investment. According to a program report, "the focus of the program is to create new and/or save primary and secondary jobs and support economic development in rural Oregon." Services offered by the program include technical assistance, assistance in workshop or seminar planning, and referral information. The program has an advisory committee made up of university and economic development organization representatives.

(3) Small Business Development Center—The center provides assistance to small businesses in five counties. Services include advising clients who are establishing new businesses, referral information, and seminars, workshop, and conferences. The center also provides a two-year instructional program for small businesses, where participants attend monthly classes and instructors make on-site visits to businesses.

(4) Mine Safety and Health Training Program—In the past several years new gold, silver, and copper mines have been developed in eastern Oregon, creating regional needs for personnel trained in mining. This program provides education and training to meet these needs. It also furnishes safety advice to mining operations.

(5) NASA Industrial Applications Center Affiliate—The Regional Services Institute serves as Oregon's access to the National Aeronautics and Space Administration (NASA) research database. On-line access to the database is available.

(6) Rural Oregon Marketing Program—This program is a network designed to match buyers and good producers with local product suppliers. It allows small businesses in rural eastern Oregon the opportunity to bid for contracts in larger urban centers. Computer networking for the program is achieved through electronic mail.

Each of the six institute programs has been involved in a number of individual projects. Projects conducted in 1990-91 include:

- A study of the economic and social impacts of a correctional institution in eastern Oregon's Malheur County, conducted for the Oregon Department of Corrections and the county;
- A marketing and feasibility study for a railcar repair facility, conducted for Harney County and the Oregon Department of Economic Development; and
- Assistance in producing a strategic plan for an area wood products manufacturing firm.

Achievements and/or Future Directions. The Regional Services Institute has received state and national recognition: the Oregon Economic Development Award, Education Institution Division, 1989; the Council for Economic Development's Tom Current Award for outstanding contributions to economic development in Oregon, 1987; and the American Society for Public Administration for Career Excellence Award, 1986.

Contact Person. Terry Edvalson, Director, Regional Services Institute, Eastern Oregon State College, 1410 "L" Avenue, La Grande, OR 97850, (503) 962-3755 or (800) 452-8639.

25. **Area Health Education Centers** (Arizona, New Mexico)

Area Health Education Centers (AHECs) were developed in response to the Carnegie Commission on Higher Education's report Higher Education and the Nation's Health, and were enacted into law by the Comprehensive Health Manpower Training Act of 1971. Their primary mission is to increase the number of health care practitioners in rural areas throughout the nation. Currently there are 32 AHECs located at colleges and universities across the nation.

There are nine AHEC headquarters in the WICHE region. The following is a description of two centers.

Arizona AHECs were started in 1984 to improve and increase rural health care access and the number of rural health care professionals. In cooperation with the University of Arizona and several state agencies, five centers provide off-campus health care education in rural areas, mentor local minority and economically disadvantaged students interested in the health professions, and support rural working professionals through continuing education. Since the program's beginning, over 14,000 people have participated in various health training components. The centers originally were funded through a Fund for the Improvement of Postsecondary (FIPSE) grant; recently their funding has been taken over by the state.

In addition, Arizona School of Medicine students do rural rotations at the centers. On-site experience and training has improved rural health care, increased the number of practitioners, and improved personnel retention rates.

The New Mexico AHEC Program is headquartered at the University of New Mexico and is funded by a federal grant. It has two centers, one at Luna Vocational Technical Institute and the other at New Mexico State University in Las Cruces. As with centers in Arizona, their mission is to improve the distribution of health professionals and increase the number of minority students entering the health professions.

Services provided by New Mexico AHECs include recruitment of students from underserved areas; off-campus preceptorships in rural locations; library resources; continuing education, workshops, and telecommunicated information; and community health education in areas such as mental health, substance abuse, AIDS, aging, and child health.

Contact Person. Arizona Area Health Education Centers, Rural Health Office, College of Medicine, University of Arizona, 3131 East Second St., Tucson, AZ 85716, (602) 626-2432. New Mexico AHEC Program Office, Area Health Education Center (UNM/AHEC), School of Medicine, 2701 Frontier NE, Albuquerque, NM, 87131, (505) 277-2442.

26. **Central Oregon Consortium for Higher Education** (Oregon)

The Central Oregon Consortium for Higher Education (COCHE) grew out of a need for access to four-year higher education degree programs in central Oregon—the nearest four-year institution is 128 miles away. Based at the Central Oregon Community College, the consortium provides access to five baccalaureate and two master's degree programs. Planning for the consortium by community leaders and the community college began as early as 1977; the program was established in 1989 with funding from the Oregon Legislative Assembly and the federal Fund for the Improvement of Postsecondary Education.

COCHE is a broker that contracts with four-year institutions in Oregon to bring upper level degree programs to central Oregon. Faculty from the colleges and universities travel to Central Oregon Community College to teach the courses and serve as advisors to

students enrolled in their degree programs. In addition, some classes are offered via ED-NET and microwave.

COCHE was designed especially to serve placebound adults. To that end, the program offers courses evenings and weekends, identifies the necessary coursework to complete the degree well in advance so that students can plan ahead, and guarantees enough offerings so that a student can complete the degree program. Approximately 200 students participate in COCHE. The average student is 42 of age, and most work full-time.

The following are the five baccalaureate degree and two master's degree programs offered:

- Bachelor of Arts or Science in Liberal Studies from Oregon State University;
- Bachelor of Arts or Science in Business Management from Linfield College;
- Bachelor of Science in Business Information Systems from Linfield College;
- Bachelor of Arts or Science in Human Services from the University of Oregon;
- Bachelor of Science in Nursing from Southern Oregon State College;
- Executive Master in Public Administration from Lewis & Clark College; and
- Master in Instructional Leadership from the University of Oregon.

COCHE has a diversified funding base with student tuition paying for approximately 45 percent of total program costs. The rest comes from the Oregon State System of Higher Education, federal and state grants, private grants, and Central Oregon Community College.

Achievements and/or Future Directions. COCHE is planning 10 new degree programs in 1993 to serve between 300 and 500 students.

According to COCHE's director, there are three challenges confronting the program: (1) the cost of bringing degree programs to the area; (2) existing federal and state regulations and policies "designed for traditional campuses with traditional students"; and (3) limited state resources available to higher education as a result of Ballot Measure 5, a voter-approved measure rolling back property taxes over five years.

Contact Person. Viviane Simon-Brown, Director, Central Oregon Consortium for Higher Education, Central Oregon Community College, 2600 NW College Way, Bend, OR 97701-5998, (503) 382-6112.

27. **Electronic Distance Education in Utah** (Utah)

EDNET is a two-way interactive audio/video closed circuit microwave education network in Utah. It delivers K-12 and college courses to 21 classroom sites across the state, including sites at Utah's nine public colleges and universities. According to an Education Network newsletter, in summer 1991 more than 148 programs were delivered via EDNET—57 percent of the programs were instructional, for-credit coursework, while the remaining 43 percent were informational programs (e.g. meetings, teleconferences).

Of EDNET's instructional time, more than one-half is used for public school education. Some of the instructional courses offer concurrent high school and college credit at Utah State University and other institutions. Higher education telecourses offered by Weber State University, Utah State University, Utah Valley Community College, and the University of Utah include nursing, economics, education, special education, political science, history, and philosophy.

EDNET is managed by the Utah Education Network (UEN) Consortium, a Utah State Board of Regents initiative. Representatives from colleges and universities, applied technology centers, school districts, the private sector, and economic development offices are members of the consortium. In addition to managing EDNET, the consortium manages KULC-TV, a statewide educational television station. EDNET and KULC-TV programs are housed at the University of Utah. In fall 1991, 1,086 students enrolled in KULC's nine telecourses, an increase of 119 percent over the previous year. Through KULC-TV, Salt Lake City Community College, University of Utah, Utah Valley Community College, and Southern Utah University offer courses in mathematics, science, literature, history, and geology.

In addition to those telecommunicated courses, Utah State University uses the COM-NET Electronic Distance Education system to provide degree programs at 16 sites, including the state prison. Developed in 1984, COM-NET is a two-way interactive audio/video network that averages more than 1,200 enrollments each quarter.

The Utah Telecommunications Cooperative is a voluntary council that coordinates technical and policy matters affecting Utah's telecommunications infrastructure. Representatives from state agencies, higher education, public education, telephone companies, the governor's office, and cable television serve on the council.

Achievements and/or Future Directions. Recently passed legislation and a $2 million appropriation will expand the use of EDNET to at least 35 more rural high schools. Compressed video, a relatively new technology whereby courses are delivered via telephone lines, will be used.

Contact Person. Don Carpenter, Associate Commissioner for Planning, Utah System of Higher Education, State Board of Regents, 355 W. North Temple, 3 Triad Center, Suite 550, Salt Lake City, UT 84180-1205, (801) 538-5247.

VII. REGIONAL PROGRAMS

Regional resource sharing is an important means by which states can work cooperatively to meet educational needs. The programs described here are designed to maximize state resources, reduce unnecessary duplication of academic programs, and provide students access to programs not available in their home states. They are programs that have legitimacy among state legislators and institutional leaders, are funded at least in part by state appropriations, and serve western states.

28. **WAMI Program** (Washington, Alaska, Montana, Idaho)

The WAMI program is a medical education agreement between the University of Washington School of Medicine and institutions in Washington, Alaska, Montana, and Idaho. Initiated in 1971, the program is designed to provide access to medical education and expand the distribution of physicians in rural areas of the WAMI region.

Washington has the only medical school in the WAMI region. The program enables residents from the four WAMI states to attend the first year of medical school at a university in their own state, and the following three years at the University of Washington School of Medicine in Seattle[6]. Ten students from Alaska and 20 students each from Montana and Idaho are guaranteed admission each year. In addition, 20 Washington residents who complete their first year at Washington State University participate in the program. First-year programs at Washington State University and the University of Idaho share resources and students split their class time between those campuses. Students from Alaska, Montana, and Idaho are accorded Washington "residency status" for the WAMI program, receiving the same preferential treatment traditionally reserved for resident students. The program has a contract with each of the WAMI states, whose legislatures appropriate funds per student to cover the medical education costs. Some states require additional fees from students.

The first-year medical school courses are developed jointly by faculty from the five universities affiliated with WAMI. University of Washington faculty visit participating campuses to share curriculum ideas and resources.

In the third and fourth years of medical training, students in the program have the opportunity to spend six weeks working with private physicians in rural areas in the region. These clinical rotations, called Community Clinical Units (CCUs), are designed to expose students to rural health care delivery and encourage them to seek careers in underserved communities. Medical faculty from the University of Washington visit the CCUs to consult and assess the progress of students.

The WAMI Program has been extensively evaluated throughout the two decades since it first began. Evaluations indicate that the academic achievement of WAMI students is as high as the achievement of students not associated with the program.

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[6] The universities offering first-year medical school programs for WAMI are: University of Alaska Anchorage; University of Idaho; Montana State University; and Washington State University.

WAMI students differ from other medical students in two important ways: they are more likely to practice in rural areas and to return to their state of residency or to another state in the WAMI region to practice primary care medicine. According to WAMI, 28 percent of its graduates practice in rural areas compared with only 13 percent of all U.S. physicians.[7] Some 65 percent of WAMI students establish medical practice in one of the four WAMI states; 40 percent return to their state of residency. This latter number compares with 25 percent of students nationally who attend in-state schools and stay to establish practice in state.

Achievements and/or Future Directions. The WAMI Rural Hospital Project (RHP), established in 1985, grew out of a concern that even though the WAMI medical education program addressed the workforce supply needs for rural communities, the needs of rural hospitals largely were unaddressed. Community underutilization of rural hospitals and the lack of sufficient long-range planning threatened their existence. The Rural Hospital Project's goal has been to "design and test a method for helping rural communities improve the financial stability, quality, and relevance of their local health care services, with a special focus on the role and function of rural hospitals." (Rosenblatt, 1991).

Over a period of three years, project members worked with six rural hospitals and communities to conduct needs assessments, determine the services hospitals should offer, develop strategic plans, and implement project recommendations. In addition, extensive evaluation of the program has been conducted. The success of the three-year project has spurred approximately 40 hospitals to become involved in the project, now called the Community Health Services Development Program.

Additional programs are available through the individual universities participating in WAMI. These include summer internships in rural regions, a summer research training program, and a premedical program targeting students from diverse racial and ethnic backgrounds.

Contact Person(s). D. Daniel Hunt, M.D., Director, WAMI Office, School of Medicine, University of Washington, Seattle, WA 98195, (206) 543-5560. Peter Hovic, M.H.A., Director, Community Health Services Development Program, School of Medicine, University of Washington, Seattle, WA 98195, (206) 685-0401. Alaska: Michael J. Dimino, Ph.D., (907) 786-4745. Idaho: Michael Laskowski, Ph.D., (208) 885-6696. Montana: Stephen Guggenheim, Ph.D., (406) 994-4411.

29. **Western Interstate Commission for Higher Education** (Western United States)

The Western Interstate Commission for Higher Education (WICHE) was established in 1953 by the Western Regional Education Compact, an interstate agreement among

[7] The 13 percent figure of U.S. physicians practicing in rural areas is based on 1982 numbers; the 23 percent of WAMI graduates practicing in rural areas refers to 1975 - 1981 graduates.

western states[8]. Its mission is to "facilitate resource sharing, collaboration, and cooperative planning among the western states and their colleges and universities." WICHE is funded by member and affiliate state dues and by grants from federal agencies, foundations, and corporations.

WICHE's founding interstate compact established a commission composed of three persons from each member state, appointed by their respective state governors, to provide policy and program guidance. Commissioners represent a cross-section of leaders from state legislatures, colleges and universities, state higher education agencies, faculties, professional groups, and the private sector.

In addition to administering a number of cooperative programs, WICHE conducts research and policy analysis on public higher education issues, and provides legislative policy workshops. The following describes some ongoing WICHE programs and special projects.

(1) WICHE Student Exchange Programs. WICHE offers three student exchange programs. The Professional Student Exchange Program (PSEP) enables students in 13 western states to enroll in participating out-of-state professional programs when those fields of study are not available at public institutions in their home states. Exchange students pay resident tuition (or reduced tuition at private institutions) and their sending states pay an additional support fee. In 1991, 1,067 students enrolled in 103 programs.

Twelve WICHE states participate in the Western Undergraduate Exchange (WUE). To attend one of the 92 participating two-year and four-year colleges, WUE students pay 50 percent more than the school's standard state resident tuition (a discount for western nonresident undergraduates). In 1991, enrollment was almost 5,400 students.

Finally, the Western Regional Graduate Program (WRGP) enables students from 14 western states to enroll in participating out-of-state graduate programs at resident tuition rates. WRGP includes 142 master's and doctoral degree programs at 40 institutions.

(2) The Western Cooperative for Educational Telecommunications (WCET) was established in 1989 to bring together users and providers of educational telecommunications and help them make the most effective use of technology through cooperation and collaboration. WCET makes information, resources, and expertise available to its 150 members, who pay annual dues and are actively involved in planning and implementing a variety of multi-state projects. Current activities and services include publishing a quarterly newsletter, Communiqué;

[8] WICHE's member and affiliate states are Alaska, Arizona, California, Colorado, Hawaii, Idaho, Minnesota, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming.

facilitating the development of a satellite-delivered degree program in library science education; evaluating campus-based degree programs delivered via technology; leading a group of five organizations in developing videotapes, user guides, and handbooks that deal with community implementation of national education goals; and examining state regulatory policies with regard to educational uses of telecommunications networks.

(3) The WICHE Mental Health Program, established in 1955, focuses on mental health workforce development, and on the improvement and utilization of state mental health data systems. Its services take the form of training workshops and seminars, conferences, multi-state policy meetings, research on mental health system issues, publications, and consulting. Recent activities included a teleconference on forensic psychiatry which provided staff training opportunities via satellite to numerous sites in 20 states. For more than a decade, the program has worked with states and community mental health programs in making the transition from primarily hospital-based to community-based mental health services. The Mental Health Program also assists mental health programs in western states with implementing the Mental Health Statistics Improvement Program (MHSIP) of the National Institute for Mental Health. Part of the program's budget is funded by member states' annual dues; the rest comes from external grants.

(4) The Institutes on Ethnic Diversity. Beginning in 1991, and for the following three years, WICHE will convene five Institutes on Ethnic Diversity to help some 20 colleges and universities increase their effectiveness in the recruitment, retention, and graduation of racial and ethnic minority students. The institute assists colleges and universities through an interactive campus-based process to develop and build strategic diversity plans and initiatives. Each institution appoints a core campus team of administrators, faculty, and student affairs staff, which is responsible for developing and implementing diversity strategic plans. The first pilot of the institute was conducted in Colorado in October 1990, with three institutions representing the Colorado State University System. In 1992, institutes will be convened in New Mexico and North Dakota.

Achievements and/or Future Directors. More than $700,000 recently has been granted to WICHE by private foundations for projects aimed at increasing the higher education participation rates of racial and ethnic minority students. One grant supports the Institutes on Ethnic Diversity described above. The other is a grant for the Minority Doctoral Scholars Program. The program is a joint effort by WICHE, the Southern Regional Education Board (SREB), and the New England Board for Higher Education (NEBHE) to bring together states and institutions in order to encourage promising minority undergraduates, support fellowships for minority graduate students, and place these new Ph.D.s in faculty positions in their home states.

Contact Person. Richard W. Jonsen, Executive Director, WICHE, P.O. Drawer P, Boulder, CO 80301-9752, (303) 541-0200.

30. **NorthWestNet** (Alaska, Idaho, Montana, North Dakota, Oregon, and Washington)

NorthWestNet is a high speed supercomputing network serving higher education institutions, government laboratories, and private businesses in six western states. It was established in 1987 by WICHE and the Northwest Academic Forum[9] and is funded by a grant from the National Science Foundation. As of 1992, NorthWestNet is administered by the Northwest Academic Computing Consortium (NWACC), a nonprofit corporation in Washington state.

The network is used for national and international electronic mail by universities and businesses, for transferring data files and software, and for other kinds of research and collaboration. There are an estimated 20,000 network users among the originating 10 NorthWestNet sites in the six-state region. Organizations that have access to NorthWestNet pay member dues.

Achievements and/or Future Directions. NorthWestNet's goals over the next two years are: (1) to expand its networking services to all colleges and universities and the entire public, private, and government research community in the six states; and (2) to expand to include not only supercomputer but library and other networking services as well.

Contact Person. Eric Hood, Executive Director, Northwest Academic Computing Consortium, 15400 SE 30th Place, Suite 202, Bellevue, WA 98007, (206) 562-3000.

31. **Western Institute of Nursing** (Western United States)

The Western Institute of Nursing (WIN) is the western regional nursing organization that succeeded the Western Council on Higher Education for Nursing (WCHEN). WCHEN was an integral part of WICHE from 1957 to 1985. The mission of WIN is to influence positively the quality of health care for the people in the West, by monitoring relevant issues and trends, and by designing, implementing, and evaluating regional, action-oriented nursing strategies in nursing education, practice, and research.

WIN recently completed a project designed to bring the most current and relevant information from nursing practice, research, and education to nurses who daily confront the issues of aging in various clinical settings. As a result of this project, 14 teams of nurses from practice and education were trained to conduct education programs related to quality care for the elderly. Over 900 nurses from a variety of settings attended the workshops held in 13 western states. As part of a National Action Plan for the education

[9] Members of the Northwest Academic Forum are academic officers from public and private universities, system offices, and governing and coordinating boards in Alaska, Idaho, Montana, North Dakota, Oregon and Washington. The forum convenes annually to exchange information or issues affecting higher education in the Northwest and discuss opportunities for regional cooperation.

of nurses and students about alcohol and other drug abuse, WIN also conducted a workshop entitled "Ethnic Identity and Family Strengths: Positive Forces Against Substance Abuse."

WIN and its associated society, the Western Society for Research in Nursing (WSRN), disseminate research that adds to the body of nursing knowledge at an annual conference and through proceedings of that conference. In 1992, part of the agenda at the annual research conference was to develop papers that reflect on past nursing research to set future direction.

Achievements and/or Future Directions. WIN will continue to address issues in health care in general, and nursing education, practice, and research in particular, from a regional perspective.

Contact Person. Jeanne Kearns, Executive Director, Western Institute of Nursing, P.O. Drawer P, Boulder, CO 80301-9752, (303) 541-0243.

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APPENDIX

The following is a list of all of the programs recommended by State Higher Education Executive Officers (SHEEOs) for consideration in this publication:

Alaska

- Alaska Center for International Business, University of Alaska Anchorage
- Alaska Native Health Career Program
- Cooperative Agreement, University of Alaska, Small Business Administration, and the State of Alaska
- Kachemak Bay Branch, University of Alaska Anchorage
- Literacy Council of Alaska
- Small Business Development Center of Alaska
- Upward Bound Program
- WAMI Program

Arizona

- Arizona Area Health Education Centers
- Arizona Education Telecommunications Cooperative
- Arizona Technology Development Corporation
- Maricopa County Community Colleges
- The Morrison Institute for Public Policy, Arizona State University
- Optical Sciences Center, University of Arizona
- Project PRIME (Partnership to Improve Minority Education)
- Small Business Development Centers

California

- Bakersfield College Tech Prep/Associate Degree Forestry Program
- California Academic Partnership Program

Colorado

- Pueblo School District 60/University of Southern Colorado Alliance

Hawaii

- Hawaii School/University Partnership
- Project S.U.C.C.E.S.S
- Small Business Development Center Network
- The Unified Health Care Training Project by Kapiolani Community College, the University of Hawaii School of Medicine, and the State Department of Education

Idaho

- Idaho Small Business Development Centers
- Rural Teacher Education Program, Lewis Clark State College

Minnesota

- Minnesota SURE Access

Montana

Montana Entrepreneurship Center
Montana State University Teacher Education program

Nevada

Center for Business and Economic Research, University of Nevada, Las Vegas
Nevada Industry, Science, Engineering, and Technology (NISET) Task Force
Nevada Small Business Development Centers
Truckee Meadows Community College

New Mexico

Cooperative Education Network
New Mexico Area Health Education Centers

North Dakota

Total Quality Improvement in the North Dakota University System

Oregon

Central Oregon Consortium for Higher Education
Labor Education and Research Center
Office of International Research and Development, Oregon State University
Oregon Executive MBA Program, University of Oregon, Oregon State University, and Portland State University
Oregon Health Information Online, Oregon Health Sciences University
Oregon Partnership for International Education
Regional Services Institute, Eastern Oregon State College

South Dakota

Business and Education Institute, Dakota State University
The Center for the Advancement and Study of Tourism
Division of Lifelong Learning and Outreach, South Dakota State University
Engineering and Environmental Research Center
Northern Great Plains Water Resources Research Center, South Dakota State University
Partnership to Protect Shallow Ground Water Aquifers
South Dakota Business Opportunity Center, University of South Dakota

Utah

Electronic Distance Education in Utah
Utah Educational Technology Initiative
Utah Partnership for Educational and Economic Development

Washington

Center for Entrepreneurial Studies, Eastern Washington University
Puget Sound Educational Consortium
Spokane Business Incubator
Spokane Intercollegiate Research and Technology Institute
Washington Area Health Education Center
Washington State Business Assistance Center
Washington State Institute for Public Policy, The Evergreen State College

Wyoming (University of Wyoming)

Business Assistance Center
IBM Teacher Preparation Program
Public Utility Research and Training Institute
University of Wyoming Utility Consortium
Western Coal Consortium